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JUNE, 1897. VOL. IX. NO. 6.

The Geographical Journal

INCLUDING THE PROCEEDINGS OF THE ROYAL GEOGRAPHICAL SOCIETY.

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The Geographical Journal.

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The
Geographical Journal.

No. 6. JUNE, 1897. Vol. IX.

ANNIVERSARY ADDRESS, 1897.*

By the PRESIDENT.

On our anniversary this year we also celebrate, with feelings of loyalty and devotion, the sixtieth anniversary of the reign of our gracious sovereign and patron, Queen Victoria. We look back for sixty years, and find my respected predecessor, Mr. William R. Hamilton, and his Council offering their congratulations on the young Queen's accession. In their letter of July 8, 1837, they expressed their "heartfelt thanks for Her Majesty's gracious condescension and munificence in granting to us the honour of her royal patronage, and in bestowing upon the Society a royal premium for the encouragement of geographical science and discovery. They confidently anticipated that Her Majesty's reign would be famed for its glory and prosperity, and for the promotion of geographical knowledge."

With our Queen's reign commenced the series of Presidential addresses. The first was delivered by Mr. William R. Hamilton, whose honourable career ought not to be unfamiliar to the present generation of Fellows. Born in 1777, Mr. Hamilton entered the diplomatic service when very young, was secretary to Lord Elgin at Constantinople in 1799, and was employed on a special mission to Egypt in 1801. He rescued the trilingual stone of Damietta, and saved the Elgin marbles after the shipwreck off Cerigo. Mr. Hamilton was Under-Secretary of State for Foreign Affairs during a momentous period, from 1809 to 1822, and Minister at Naples from 1822 to 1825. He then gave himself up to the pursuits of literature and science, was a trustee of the British Museum, treasurer of the Royal Institution, a founder of the Hakluyt

* Delivered at the Anniversary Meeting of the Royal Geographical Society, May 17, 1897.

Society, President of the Dilettanti Club, twice President of this Society, and well known in London society for thirty years. The duty devolved upon Mr. Hamilton of congratulating our patron on her accession, and of delivering the first Presidential address, in which he reviewed the state of geographical knowledge in 1837, the year of Her Majesty's accession.

It cannot fail to be interesting to look back upon our position when the Queen came to the throne, as described by our President, Mr. Hamilton, and by our accomplished Secretary, Captain Washington, R.N. Of the Ordnance Survey of England, 75 sheets had been issued out of 120 of which the whole map was to be composed. In Scotland the primary triangles were unfinished. The Townland Survey of Ireland was making progress, and an admirable memoir of the county of Londonderry had been published, which was intended to be the first of a series. It might serve as a model for the descriptions of counties which have since been proposed by Dr. Mill. In India, 36 sheets of the 150 which were to complete the atlas had been published; the officers of the Indian Navy were actively engaged in surveying the coasts; Lieut. Wellstead had reported the details of his journey into the interior of Omân; and Sir Alexander Burnes was exploring the course of the Indus. As regards Persia, Mazanderan and Azerbijan had been described by Monteith and D'Arcy Todd, Taylor Thomson had ascended the peak of Demavend, but Sir Henry Rawlinson's invaluable memoirs had not yet been received. The expedition of Colonel Chesney on the Euphrates had just completed its labours, and that distinguished explorer was the first to receive the Royal Award after Her Majesty's accession.

The interiors of China and Japan, of Central Asia, Tibet, and Afghanistan, were practically unknown.

A glance at a map of Africa in 1837 is still more suggestive of the marvellous progress of geographical discovery during the Queen's reign. Our Secretary, Captain Washington, had written an exhaustive memoir on Morocco and the Atlas range. The Barbary States, Egypt to the second cataract, and part of Abyssinia were fairly well known. There were the discoveries of Mungo Park on the Niger, the routes of Denham and Clapperton, and the important discovery of the mouths of the Niger by Lander, which entirely altered preconceived ideas of a vast region. Mr. Beecroft had ascended the old Calabar river and the Quorra; and Mr. McGregor Laird had reported on the commerce and navigation of the great river, which was opened to trade in 1830 by Lander. Knowledge of South Africa was bounded by the Orange river until the very year of the Queen's accession, when Sir James Alexander returned from his journey of 1500 miles through the country of the Namáquas and Dámaras. With these exceptions the map of Africa was a vast blank, with three black caterpillars crawling on it. One was marked "the Mountains of the Moon," another "the Kong Mountains," a third "the

Laputa Mountains," or "Spine of the World," with an imaginary lake Maravi by its side, indicated by a dotted line. Here, in unknown Africa, there was a vast field for the labours of our Society.

Australia presented another field for discovery. Captain Charles Sturt had completed the exploration of the great river system to the westward of the Blue mountains, by tracing the river Murray to its mouth, and naming it after Sir George Murray, the second President of this Society. In 1836 Sir Thomas Mitchell, following up the work of Sturt, had discovered the fine tract of country which he named "Australia Felix," now the colony of Victoria. The town of Melbourne was founded just before the Queen's accession. On the north-west coast the results of the expedition led by Lieuts. Grey and Lushington had not yet been received, and for the rest, the map of Australia, like that of Africa, presented a vast blank.

In North America, Dease and Simpson had connected Sir John Franklin's surveys with those of James Ross, and had thus accomplished the glorious task of determining the northern limits of the continent; but vast tracts of the Hudson's Bay Company's territory, of the western region claimed by the United States, and of a wider region still claimed by Mexico, were practically unknown. In South America, the Society was employing Sir Robert Schomburgk to explore the interior of British Guiana. He was engaged on this service, and was doing admirable work at the time of the Queen's accession, his expenses being mainly defrayed by our Council. Lieuts. Maw and Smyth, of the Royal Navy, had descended the Amazon, and Captains King and Fitz Roy, having completed their famous surveys of the Straits of Magellan and their western approaches, the latter was actively engaged on the western shores of Chile and Peru. Vast tracts and the courses of many navigable rivers in the interior of South America were still entirely unknown.

In the Pacific and Indian oceans many islands, including New Guinea, were unexplored and practically unknown. But under the guidance of Sir Francis Beaufort, who was a member of our Council for nearly a quarter of a century, marine surveyors were most actively employed, both at home and abroad. I have alluded to the work of King and Fitz Roy in the Straits of Magellan and on the west coast of South America. They formed a school of surveyors—Graves in the Mediterranean, Skyring on the east coast of Africa, and Wickham and Stokes in Australasia. The most severe work was on the African coast. Captain Owen changed his whole crew and officers twice, Boteler and Skyring falling victims to the climate. The crews of the *Etna* and *Raven* all but shared the same fate. Yet Captain Vidal completed his surveys of the Canary isles, and of the west coast of Africa to Benin. "This gigantic survey," says Washington, "embracing the east and west coasts of Africa from Suez, round the Cape of Good Hope,

to the Pillars of Hercules, may be said to have been drawn and coloured with drops of blood." In short, our gallant surveyors had delineated the coast-lines, but the interiors of the continents showed enormous unknown blank areas.

The Rosses had returned from Boothia, and Sir George Back from the discovery of the river which bears his name. Prince Regent's inlet and the Hecla and Fury strait were known, while Parry had previously laid down the southern coasts of the Parry islands. With these exceptions the vast arctic area, north of the American continent, was a blank. The antarctic region was an absolute blank, except where Captain Cook had reached the 70th and Captain Weddell the 74th parallel, on different meridians.

While Mr. Hamilton thus set forth the state of our knowledge of the earth's surface in the year of Her Majesty's accession, he also gave some account of the cartography of that period, then under the able lead of Arrowsmith and Walker, and of the literature of our science; while he spoke, with that enthusiasm which inspires the same feeling in others, of the career of an explorer. "Buoyed up," he said, "in his greatest difficulties by the consciousness that he is labouring for the good of his fellow-creatures, the explorer feels delight that he is upon ground hitherto untrodden by man, that every step he makes will serve to enlarge the sphere of human knowledge, and that he is laying up for himself a store of gratitude and of fame."

Animated by the patriotic zeal so eloquently described by my predecessor, and influenced in no small degree by the desire to win the Royal Award of our Society—that guerdon bestowed by their Sovereign—British geographers, facing perils and hardships of no ordinary kind, freely risking and often giving up their lives in the cause of science, have during sixty years heroically striven to fill up the great blanks which existed on the map of the world in the year of the Queen's accession.

The geographical history of the Queen's reign was opened by Sir James Ross's Antarctic Expedition, which left England in 1839. The initiation of this memorable voyage was due to Captain Washington, R.N., our Secretary, whose suggestions were very warmly adopted by the British Association. The urgent necessity for a magnetic survey of the southern seas made it incumbent on the Government to despatch the expedition, independent of the important results to be derived from geographical discovery. James Ross had already endured eight arctic winters, and had passed sixteen navigable seasons in the polar regions, while he had acquired European fame as a magnetic observer. He was, without comparison, the fittest man for the command of the expedition, which crossed the antarctic circle on January 1, 1840. In one short month he made one of the greatest geographical discoveries of modern times, amid regions of perpetual ice, including a southern continent,

which was named Victoria Land, an active volcano 12,400 feet high, and the marvellous range of ice-cliffs. This may fairly be considered to have been the only real antarctic expedition, for Ross alone, until 1895, forced his way boldly into the polar pack, faced all its dangers, and penetrated far to the south after passing through it.

But since Sir James Ross returned in 1842, no one has been sent to continue his work. Of late years the necessity for an antarctic expedition has become more and more urgent, for many reasons, but chiefly because the science of terrestrial magnetism is at a standstill, owing to the absence of any observations in the far south during the last fifty years. The knowledge which would be acquired by such a magnetic survey will not only be of scientific interest, but will also be of practical importance to navigation. Deep-sea soundings, dredgings, temperatures of the ocean at various depths, meteorology, the distribution of marine organisms, are some of the investigations which would be undertaken by an antarctic expedition with reference to the ocean. Equally important objects would be to determine the extent of the south polar land, to ascertain the nature of its glaciation, to observe the character of the underlying rocks and their fossils, and to take meteorological observations on shore.

In November, 1893, it will be remembered that Dr. John Murray read an exhaustive and stirring paper to advocate the renewal of antarctic exploration, and that his views were endorsed by the highest scientific authorities in this country and on the continent. This Society then undertook the task of obtaining the despatch of an antarctic expedition, and I, as your President, promised that I would never swerve from that task until it was completed. I have since done my best. My communication to the Royal Society led to the preparation of a most valuable Report by a committee of that body, and to an unsuccessful application to the late Government. Our own Antarctic Committee met several times and drew up a report of a more practical character. I invited co-operation from the principal scientific bodies in this country and in Australasia, and addressed letters to the governments of the Australian colonies and of New Zealand. In December, 1894, I induced the Council of the British Association, when Lord Salisbury was in the chair, to pass a strong resolution in favour of the despatch of an expedition. In 1895 I read papers on the subject at the Imperial Institute and at the United Service Institution, which I have every reason to believe had a good effect. At the International Geographical Congress, a most important antarctic paper was read by Dr. Neumayer, of the Hamburgh Zee-warte, and a resolution was passed, urging the importance of a renewal of antarctic research in the interests of science.

Thus the subject had been well ventilated, and in the autumn of 1895 it was considered that the time was ripe for calling the attention of the First Lord of the Admiralty to the advisability and sound policy

of despatching another naval scientific expedition to the antarctic ocean. The answer, however, was unfavourable, so far as the despatch of a naval expedition was concerned. Yet there appeared to be every reason for anticipating favourable consideration for our advocacy of polar research. Mr. Goschen was himself the minister who had fitted out and despatched the *Challenger* expedition. He was, therefore, well acquainted both with the scientific advantages to be derived from such enterprises and with their public importance. But the usefulness of these expeditions to the navy is the point which we hoped would be most clear to naval administrators. The preparation for the defence of our country and our commerce must be the great object of naval operations in peace time. The building of ships is a work of such great importance that it cannot be exaggerated. But the supply of opportunities of distinction for officers and men is of still greater importance. Work requiring special care and coolness of judgment, work needing an accurate decision to be formed and acted upon on the instant, work presenting novel situations and suggesting new ideas,—all these kinds of work strengthen and form a sailor's character, widen his perceptions, and increase his self-reliance. All this is supplied by an antarctic expedition. An officer will not find exactly the same work in war service, but the work he has seen when employed on special service during peace time will have furnished him with many ideas and many experiences which cannot fail to increase his efficiency and his value.

Captain Mahan has eloquently borne witness to the fact that "good men with poor ships are better than poor men with good ships. Over and over again the French Revolution taught this lesson, which our own age, with its rage for the last new thing in material improvement, has largely dropped out of memory."

Captain Mahan spoke too truly. The great duty of seeking the means of giving our naval officers every possible opportunity of distinction in time of peace, on special service, is ignored. We have been told that officers cannot be spared from the ordinary routine of the fleet; that times are much changed from the days of the *Challenger's* commission, and are now much more unsettled. It is forgotten that the naval superiority of Great Britain, in the days of St. Vincent and Trafalgar, "lay not in the number of her ships, but in the wisdom, energy, and tenacity of her officers and seamen," and that these qualities are now to be acquired by such special service as is involved in an antarctic expedition. It is forgotten that in the good old times neither war nor the fear of war were any check to the despatch of naval expeditions of discovery. Captain Cook was sent on his third voyage at a time when France, Spain, Holland, and the American insurgents were all vainly banded together for our destruction. In the midst of the French revolutionary war, Captain Vancouver was calmly surveying the

intricate straits and sounds of New Albion, and Captain Flinders was exploring the shores of Australia.

Last November I addressed another letter to the First Lord of the Admiralty representing the necessity for organizing a private expedition if, as he had told me, it was decided that one under naval auspices could not be despatched, and urging that an undertaking of that character should at least receive substantial help, and have the good will and sympathy of Her Majesty's Government. In reply, I have been informed that the Lords Commissioners of the Admiralty regret that they are unable to take any direct part in the organizing of an antarctic expedition, although they regard the enterprise as one which is important in the interests of science. But their lordships will watch the results of a private expedition with great interest, and will be prepared not only to aid in the outfit by the loan of instruments, but also to place any experience which may have been gained in the past at the disposal of those chosen to conduct an expedition. For it must be borne in mind that hitherto, alike in the days of Cook as in the days of Ross, antarctic work has always been undertaken by the Government, and is strictly naval work.

Yet this important public service must now be undertaken by this Society, or be left undone. A great and serious responsibility thus devolves upon us. But I feel sure that the great body of the Fellows will concur with the Council in the decision that it is a duty which ought not to be shirked. We have not the means to undertake it without generous co-operation. We have, however, the sympathy and good will of the Admiralty; and we shall not, I firmly believe, appeal in vain to the patriotism and energy of private individuals in Great Britain, or to the governments in Australasia.

As the geographical history of the Queen's reign commenced with an antarctic exploration, so the sixtieth year from Her Majesty's accession should be worthily commemorated by preparations for continuing the exploration of that southern continent which bears the name of Victoria.

Turning from the south to the north polar region, we find that the work during the sixty years of the Queen's reign, which has been done by Englishmen, is of vast geographical importance. Very soon after the return of Sir James Ross, the ill-fated expedition of Sir John Franklin was despatched to attempt the long-sought passage from Baffin's bay to Bering strait, and, as is well known, the discovery was made when Graham Gore reached Simpson's cairn in the spring of 1847, but at a terrible cost. During the ensuing ten years the persistent efforts to rescue Sir John Franklin's gallant followers or to ascertain their fate led to the discovery and exploration of thousands of miles of previously unknown arctic coast-lines. Never, before or since, has difficult and perilous service been rendered from loftier motives, never

with greater enthusiasm and more single-minded zeal. The whole system of arctic travelling was organized with marvellous results. In this way the intricate and extensive archipelago north of the American continent was thoroughly explored by numerous sledge-parties. McClintock on one occasion, without the aid of dogs, travelled over 1328 miles in 105 days, in the spring of 1853; and Mecham, in 1854, also without dogs, travelled 1336 miles in 60 days, at an average of 20 miles a day. These journeys have never been rivalled or approached in arctic travelling without the aid of dogs. After the return of McClintock, in 1859, there was an interval of neglect, but the Council of this Society never relaxed in its efforts to secure the renewal of arctic exploration, until these efforts were crowned with success. In 1875–76 the expedition of Sir George Nares was despatched, and with a gallant determination in the face of great and unexpected difficulties, which ensured success, its members performed the work desired by our Council. Three hundred miles of coast-line, with all the accompanying scientific results, were added to our knowledge. Since then Leigh Smith has corrected the map of Spitsbergen, and explored the southern coast of Franz Josef Land; while the Jackson expedition is still engaged on the exploration of the Franz Josef archipelago. This is the third arctic winter that has been faced by Mr. Jackson and his companions; and we confidently anticipate that they will return after having thoroughly explored that interesting group, and made an exhaustive examination of its fauna, flora, and geology.

Englishmen have discovered the whole of the American side of the arctic regions from Bering strait to the north coast of Greenland, and have explored the intricate system of channels and straits which separate the numerous islands. They have thus thrown open to the knowledge of the world, a vast amount of information in all branches of science, and have especially taken the largest share in preparing for the solution of the polar problem. Dr. Nansen, by his memorable drift of the *Fram*, has supplied what was needed to complete the means of comprehending what had previously been a mystery. For this great service to geography Nansen has received a special gold medal from this Society; and he has rendered ever memorable, in arctic history, the sixtieth year of the Queen's reign. It saw the solution of the north polar problem.

The polar work of the last sixty years has been of surpassing interest and of immense importance. In other parts of the world, the ceaseless activity and zeal of her subjects has also rendered Her Majesty's reign a memorable epoch in the record of human progress. On the Asiatic continent, one generation after another of British surveyors and British explorers has pushed forward our knowledge until the work is now approaching completion. The Trigonometrical Survey of India is the grandest monument of the Queen's reign on the

Asiatic continent. When Her Majesty ascended the throne, Colonel Everest was in mid-career. The whole conception of the survey was the creation of his brain. Modifications and improvements have since been introduced, but nearly everything was originated by the great geodesist. Under his guidance his school of surveyors attained a degree of accuracy and perfection of skill which it would be impossible to surpass. The Meridional Arc Series is the perpetual record of his fame. Sir Andrew Waugh succeeded Everest, and his most memorable work was the North-east Himalayan Series, whence he measured seventy-nine lofty peaks, including Mount Everest, the highest in the world. From 1861 to 1883 General Walker completed the principal triangulation of India, having pushed forward the work with untiring zeal and ability, and published its history. The Great Trigonometrical Survey of India, consisting of ten measured bases and 3668 stations, thus completed, presents a record which forms one of the proudest pages in the history of English domination in the East.

While our own territories were mapped on the most rigorous scientific principles, our explorers have continued to penetrate from India into the remotest and least known parts of Asia throughout Her Majesty's reign. In the year of the coronation our gold medallist, Lieut. John Wood, R.N., was exploring one of the passes of the Hindu Kush, and, first among English explorers, he reached the Pamirs, and discovered the lake at the headwaters of the Oxus, which received the name of Her Majesty. Ten years afterwards Dr. Thomson was the first to attain the summit of the Karakoram pass, and twenty years after that Hayward and Shaw traversed the snowy range at great altitudes and penetrated into Eastern Turkistan. Little time was lost in following up these discoveries, for practically, and from the point of view of a scientific geographer, they were discoveries. Colonel Henry Trotter and his companions, not only went beyond Kashgar into the Artysh district in one direction, and into the Pamirs as far as Wood's Victoria lake in another, but also connected the Russian with the English surveys; while St. John, in 1874, completed the six-sheet map of Persia. Since then the work has proceeded almost continuously in Persia, Central Asia, Tibet, and China. In the footsteps of the Buddhist pilgrims and of Marco Polo, journeys have been made from Peking to Kashmir by Carey and Younghusband, over Western Mongolia by Ney Elias, and from Kokand to China by Littledale; while the previously unknown northern plateau of Tibet has been traversed by Bower, Littledale, and Wellby. Nor must I forget to mention our Vice-president, Mr. George Curzon, whose most valuable memoir and map of the Pamirs has just been published by our Council, following on his map of Persia in 1892. The Chinese rivers have been explored by many travellers since Captain Blakiston received our gold medal for his ascent of the Yang-tsze in 1862; and while such men as Colborne

Baber minutely examined the remote provinces of Yunan and Sechuen, Captain Gill made his very remarkable journey from Batang, on the borders of Tibet, to Bhamo, in British Burma. Much, however, remains to be done on the Asiatic continent, and it is encouraging to know that there are many volunteers, and that the geographical enthusiasm of young officers is as great as ever. We look back upon the Asiatic labours of the Queen's geographical subjects, during the last sixty years, with pride and admiration; while we know that the generous emulation it has excited in the minds of the young aspirants of the present generation ensures a vigorous continuation of the great work with the same devoted zeal, and with similar important results.

The continent of Africa was a vast blank on the map of the world in the year of the Queen's accession. Its subsequent exploration has been in great part due to the energy and liberality of this Society, of which Her Majesty is the patron. We therefore look back upon our work in that quarter of the globe with no ordinary satisfaction. The result of Dr. Beke's admirable geographical work in Abyssinia, in 1840, was to make known the true physical structure of those African highlands, and to show that the mountains of the eastern side of the continent formed a meridional chain. In another direction, Mr. Francis Galton made known the region of the Damaras and the Ovampo, while Dr. Baikie opened the navigation of the Niger. Then what may be called the Livingstone period of African discovery, extending over twenty years—from 1852 to 1872—began to throw additional lustre on the geographical history of the Queen's reign. Livingstone had already penetrated to the Zambezi, prepared himself at the Cape observatory for scientific observation, and attached the faithful Makololo tribe to his service, when he started from Luanda in May, 1854, on his memorable journey across Africa, down the course of the Zambezi. The wonderful falls of that river, more splendid even than Niagara, received from Livingstone the name of Victoria; and he reached Quilimane, after traversing the continent, in May, 1856.

On February 13, 1858, this Society celebrated its Livingstone festival, to wish Godspeed to the great explorer when he set out, with Sir John Kirk, on his second Zambezi expedition. He hoped to find, by that river, a pathway to highlands where Europeans might settle, and whence they might slowly but surely impart to the people the blessings of Christianity. Ascending the Shiré, Livingstone and Kirk discovered Lake Nyasa, and the highlands attaining a height of 6000 feet. The wishes of the discoverers were amply fulfilled in the subsequent history of Nyasa-land. Discovery led to more careful exploration. Missions followed, and the country, first made known by Livingstone and Kirk from 1859 to 1862, is now a flourishing colony with steamers on its rivers and lakes, an increasing trade in ivory and coffee, law and order fully established under the able administration of Sir Harry Johnston, and every prospect of increasing prosperity in the future.

The expeditions from the East Coast of Africa were more directly connected with this Society, aided by grants from Her Majesty's Government. It was under our immediate auspices, and mainly at our expense, that Burton and Speke, after overcoming extraordinary difficulties, discovered the shores of Lake Tanganyika. The admirable memoir on the results of his journey by Sir Richard Burton occupies the whole of one volume of our *Journal*. It was also under our auspices, and mainly at our expense, that Speke and Grant discovered the Victoria Nyanza, and thence traced the course of the Nile to Gondokoro.

The expeditions of Burton and Speke resulted in an enormous stride in our knowledge of African geography, though several great problems still remained to be solved. It was then that Sir Roderick Murchison proposed to Dr. Livingstone the work of defining the true watershed of Inner Central Africa. The veteran explorer undertook this difficult and perilous task, leaving England in August, 1865. After discovering the lakes of the Lualaba, and the Manyuema region, he was found by Mr. Stanley at Ujiji, at the end of his resources. But with fresh supplies he again turned away from home, resumed his arduous labours, and died alone, but in the midst of his discoveries, on May 4, 1873. The Society long occupied itself with schemes for the relief of Livingstone, and devoted its funds for this purpose without stint. We sent expeditions both to the West and the East Coast. Lovett Cameron, originally sent by us to search for Livingstone, made a remarkable journey in the interests of geographical discovery after he had ascertained that, without doubt, the great explorer was no more. He was the first European traveller who walked across the African continent from east to west.

There has been no halt in the steady progress of African discovery since Burton and Speke set out from Zanzibar in 1857. Twenty years afterwards Stanley discovered the whole course of the Congo, and St. Vincent Erskine descended the Limpopo to its mouth. But these grand achievements only stimulated further research, our Society always taking the lead. For five years, from 1879 to 1884, our Council sent out expeditions entirely at its own expense. Our first enterprise, after the lamented death of Mr. Keith Johnston, was led by Mr. Joseph Thomson, who ascended the river Rufizi, reached the northern shore of Lake Nyasa, examined the Lukuga outlet of Tanganyika, and discovered Lake Leopold. Our second enterprise was also entrusted to Mr. Joseph Thomson, who was to explore the region round the lofty mountains of Kilimanjaro and Kenia. He was again completely successful, and his humane treatment of the natives, his inexhaustible patience with them, and cool enduring courage, were even more admirable qualities than his enthusiasm, energy, and scientific attainments. His proudest boast was that of the 150 men who landed with him at the mouth of the Rufizi he only lost one, and that he never once had to fire a gun against a native, for either offensive or defensive purposes.

Since the return of the Thomson expedition the work of African exploration has advanced with increased rapidity. Stanley's great expedition, in which he penetrated through forests from the Congo basin to the region of Nilotic lakes, and his discovery of Mount Ruwenzori gave it an extraordinary stimulus. From Stanley's return may be dated the commencement of more scientific exploration, combining accurate survey with trained observation in other branches of knowledge. Our Society took the lead in this change, by supplying the means of geographical instruction, and the best African explorers of the last fifteen years have fitted themselves for their work in the field by going through a course under our instructor. The value of the results has increased in proportion to the increased attainments of the workers; and the names of Selous, Gregory, Grenfell, Last, Leverson, Sharpe, Scott Elliot, Lugard, and Vandeleur, may be mentioned amongst the enthusiastic and accomplished men who are rendering illustrious the present generation of African travellers.

The sixty years of Her Majesty's reign has seen the great blank space, which represented the interior of Australia in 1837, covered by the tracks of intrepid explorers in all directions. Three years after Her Majesty's accession my old friend Count Strzelecki opened Gipps's land to our knowledge. In the same year Edward John Eyre, the pioneer of South Australian explorers, discovered Lake Torrens, and in 1841 he undertook the hazardous enterprise of traversing the waterless region between St. Vincent's gulf and King George's sound. It was a splendid piece of geographical work, achieved in the face of frightful sufferings and of obstacles which to most men would have been insurmountable. Mr. Eyre, our senior living gold medallist, still survives in the enjoyment of a green old age, and of the retrospect of a life well spent in excellent service to geography, and most distinguished service to his country.

But the whole story of Australian discovery is a long record of dangers and privations nobly faced, and of indomitable pluck and determination. We read, with wonder and admiration, of Sturt's dangers and hardships at Cooper's creek in 1845, of Leichhardt's journey to Port Essington; of the crossing of Australia from south to north by Burke and Wills, and of their falling martyrs to science at Cooper's creek in 1861; of the splendid journey by M'Douall Stuart, and of the overland journey of the young Jardines along the York peninsula. The expeditions of the brothers Gregory were on a large scale, and did much valuable scientific work; while the journeys of Colonel Warburton, of John Forrest and Ernest Giles, forced the forbidding deserts of Western Australia to yield up their secrets, and to come within the explored area of the Queen's dominions. It has been the privilege of our Society to make grants of money to further Australian work, especially to the Leichhardt Search Expedition, and we have conferred Her Majesty's award on ten Australian explorers.

Nor have the islands of the Malay Archipelago and of the Pacific been neglected during the Queen's reign. Rajah Brooke commenced work in Borneo, which has been ably continued by Mr. Hore and others connected with the North Borneo Company; Wallace and H. O. Forbes have, in their fascinating memoirs relating to the Malay Archipelago, given special attention to the geographical distribution of animals; Woodford has explored the Solomon islands; and Sir William MacGregor's labours in New Guinea, so perseveringly continued and so carefully and conscientiously performed in a most trying climate, are the admiration of his brother geographers.

In the dominion of Canada, a vast amount of exploration has been achieved since we awarded the gold medal to Captain Palliser in 1859, for his work in the Rocky mountains, especially by Dr. Dawson, and under his superintendence. M. Petitot has contributed largely to our knowledge of the northern lakes, Ogilvie to that of the Mackenzie and Yukon basins, Mr. A. P. Low to that of the interior of Labrador, and Dr. Bell and Mr. Tyrrell to that of North-East Canada. But South America has received less attention. The Queen's reign opened with Sir Robert Schomburgk's admirable geographical work, undertaken under the auspices of our Society, in British Guiana; and he has had some worthy successors in the same country, especially Mr. Everard im Thurn, who accomplished the ascent of Mount Roraima in 1884. In the basin of the Amazonian valley Mr. William Chandless won our Gold Medal for his survey of the Purus, one of the least known of the tributaries of the river Amazon, for a distance of 1866 miles, by which he considerably modified the maps of the interior of South America. But on the whole this continent has received less attention than other parts of the world, though its interest yields to no other; and there is now a wider and more fruitful field for the explorer in South America than in any other part of the world.

The science of oceanography, though founded by Major Rennell, has only risen to importance during the Queen's reign, having been made popular by Maury's charming 'Physical Geography of the Sea,' and having become practically useful through the necessity for examining the floor of the ocean in order to lay telegraphic cables. The laborious investigations of Dr. Carpenter in the *Porcupine* and *Lightning* led to the equipment of a very important expedition on board the *Challenger* in 1873, commanded by Sir George Nares, with an accomplished scientific staff under Sir Wyville Thompson. During her three years' commission the *Challenger's* researches were extended over the Atlantic, Pacific, and Indian oceans, and even beyond the antarctic circle. The expedition added largely to our knowledge of the physical geography of the sea; and the publications of its results in fifty volumes, under the editorship of Dr. John Murray, is a monument of valuable and exhaustive research. The examination of

the bed of the ocean, and the investigation of its temperatures, are a branch of physical geography which has been developed during the Queen's reign, and is now a recognized part of our science, of the greatest practical importance and of the deepest interest.

The retrospect of our labours during the reign of Her Majesty cannot fail to give rise to reflections on the very important duties which this Society has to perform. It has been seen that the discoveries of the last sixty years have always been warmly supported and encouraged by our Council, and that the most important enterprises were initiated and maintained by our funds and under our guidance. To take only one example and its results from the region of eastern tropical Africa, Lakes Tanganyika and Victoria Nyanza, and an immense area of important country previously unknown, were discovered and afterwards fully explored entirely through the initiative and mainly by means of the funds of the Royal Geographical Society. The result has been, not only that numerous facts of deep interest have been added to the sum of human knowledge in all branches of science from this region alone, but also that our labours have formed a firm and solid foundation for an enlightened phase of imperial policy, and for measures with a view to the establishment of trade routes and colonies, the beneficial effects of which will be felt in the distant future.

When we contemplate these immediate consequences of our geographical work, it will, I am sure, be felt by all who are connected with this great Society, that it occupies a position of national importance, a position which entails most serious duties and heavy responsibilities. It is our privilege to render frequent services to several departments of the Queen's Government; to take the lead in numerous enterprises, many of which are eventually recognized, in their results, as involving considerable benefits to the nation; and to prepare the means, by our great collections of books and maps, and by the facilities we can give for instruction, for others, including the authorities under Imperial guidance, to follow in our footsteps.

It has been these considerations which have led to the system of instruction for our discoverers and explorers which has now been so satisfactorily and efficiently established by our Council. I am glad to be able to announce that a measure has been adopted which I have been advocating at intervals during the last twenty years. A diploma is to be granted to those pupils of Mr. Coles who have gone through a complete course of instruction, and whose sufficiency is certified to by a committee consisting of the instructor and two members of our Council. A statement of the course of instruction in practical astronomy and surveying, given under the direction of the Council, has been printed and sent for information to the War Office, Colonial Office, and India Office. These diplomas will, I feel sure, be highly valued by those who receive them, especially by officers in the civil or military employment

of Her Majesty's Government, the demand for instruction will increase, and the efficiency of the discoverers and explorers of the future will be enhanced tenfold.

For it must be remembered that much remains to be discovered and explored in all parts of the world. I am desirous of having statements drawn up, and placed in the hands of the Secretary for the use of inquirers, explaining what geographical work remains to be done on each continent. Mr. Ney Elias has drawn up such a memoir for Asia; Mr. Ravenstein has undertaken to prepare one for Africa; and, assisted by Colonel Church, I have myself written one for South America.

The measures for promoting the study of geography throughout the country, which have been adopted from time to time by the Council, have not been without satisfactory results. Undoubtedly they have, at least, had the effect of securing the attention of those who are engaged in the profession of education, and of enforcing the necessity of adopting improved methods. They have led to the establishment of a permanent geographical readership at the University of Oxford, as I was able to announce last year. The Council has now resolved to give a large measure of support, out of the Society's funds, to a London School of Geography, if such an institution should be successfully established under Mr. Mackinder's auspices. Our plans have been altered, as we acquired experience, but our aim has always been the same—to train good geographical teachers, and to promote the teaching of geography on a sound basis in our secondary schools and universities.

The record of the last sixty years has been one of arduous effort, of rapid progress in some directions, of steady progress in all, and it has been a record of unvarying success. Our numbers have increased from less than 600 in 1837 to 3845 in 1897. Our income has increased from £1300 in 1837 to £11,000 in 1897, and our expenditure from £1262 in 1837 to £10,820 in 1897. Our power of disseminating geographical knowledge, and promoting geographical discovery and exploration, has, of course, increased in proportion. Thus we could only spend £400 on our *Journal* and its illustrations in 1837; now we spend £3415. The cost of our evening meetings in 1837 was £9; now, including refreshments, lantern slides, hand-maps, reporting and printing, it is £542. These figures tell their own story. During Her Majesty's long and glorious reign, the Royal Geographical Society has developed from a small and struggling, though deserving and promising, institution, to a great and powerful body, with numerous important duties; with powers which, when well directed, as I believe they almost always have been, are of value to the nation; and with corresponding responsibilities.

In loyally commemorating this sixtieth anniversary, we look back over the period that has elapsed, since our President of 1837 addressed his letter of congratulation to Her Majesty on her accession, and of thanks

for the interest the young Queen had shown in our Society, by her patronage and her bounty. Through all that long period of resolute endeavour to advance the cause of geography, this Society has loyally striven to deserve the high honour of having the Sovereign for our patron, and of being entrusted with the very responsible duty of annually conferring her royal awards. But the approval of Her Majesty, when her subjects have distinguished themselves by performing arduous and valuable geographical work, has not been confined to the bestowal of awards through our Council. On more than twenty occasions the Queen has been graciously pleased to confer special honours on those explorers and geographers who have also received the awards of this Society. The desire to win these distinctions, and to obtain this gracious approval, has always been a strong incitement to those gallant and intrepid geographical heroes who, with thoughts full of loyalty to their Queen, have rendered her reign glorious by filling in the great blanks which spread over Asia, Africa, Australia, and the arctic regions in 1837, when Her Majesty ascended the throne.

In offering, therefore, our respectful and loyal congratulations on the completion of the sixtieth year of a glorious reign, the President, Council, and Fellows of this Society do so with the conviction that our marvellous advances in all that relates to the progress of our science are due, in no small degree, to the tokens of approval bounteously accorded, and to the fervent feelings of affectionate loyalty inspired by our most gracious sovereign and patron, Her Majesty Queen Victoria.

FOURTH CENTENARY OF THE VOYAGE OF JOHN CABOT, 1497.*

By the PRESIDENT.

THE discovery of North America by Englishmen, led by a Genoese pilot, under the direct authority of Henry VII., is an important event, second only to the discovery of the West Indian islands by Spaniards, led by another and a greater Genoese pilot, whose fourth centenary we celebrated five years ago. But, unfortunately, the records of the two voyages have not met with equally careful treatment. The memory of Christopher Columbus was venerated. His letters and his journal were preserved, and his life was written by an affectionate and truth-respecting son; so we know not only all the details of his life-work, but the man himself, with his virtues and his faults. It has fared very differently with John Cabot. Not a single scrap of his own writing has been preserved. The few meagre details that have come down to us are at second-hand and sometimes contradictory, and an

* Paper read at the Royal Geographical Society, April 12, 1897. Map p. 602.

undutiful son ignored the achievements of the great explorer and tried, only too successfully, to appropriate his renown. Hence we can only grope in the dark, among doubtful materials, and form an outline of the most probable course of events during the Cabotian voyages.

These voyages are, however, not so important as those of Columbus, because they were not a turning-point in the maritime history of the country which sent them forth, and because they did not immediately lead to colonization. Indeed, there was an interval of 110 years between the discovery of North America and the founding of the first permanent colony in Virginia.

There was great activity in English seaports, increasing commercial enterprise, and even voyages of discovery, long before the ventures of John Cabot, which were merely episodes in the history of the maritime progress of our country. Bristol took the lead in the fifteenth century; but Southampton, London, and some eastern ports were not very far behind, and voyages were made to the Mediterranean, to the Baltic, and even to Iceland.

William Canynge, the leading Bristol merchant in the reigns of Henry VI. and Edward IV., is recorded to have had ten large trading ships, which made voyages to the ports of the Teutonic Knights, to Halgoland, Finmark, and Iceland; and the spirit of enterprise, and even of discovery, was then abroad. Canynge lost a vessel of 160 tons on the Iceland coast, and in 1477 Columbus himself learnt from English sailors of Bristol the management of an ocean voyage, when he visited Ultima Thule. The spirit of maritime discovery was developing rapidly in England, and William Wyrcestre, a Bristol man, tells us of one important undertaking, but doubtless there were many others that were unrecorded. On July 15, 1480, a vessel of eighty tons sailed from Bristol under the command of Captain Thylde, the most scientific seaman in all England at that time. His object was the discovery of land to the west of Ireland called "Brasylle," and he seems to have made a very gallant attempt, battling for two months against the Atlantic storms, and not returning until September 18. Thylde was the English father of exploring enterprise. Once aroused, it was not allowed, by the Bristol merchants and seamen, to slacken; for it is stated by the Spanish ambassador that, from 1491 to 1498,* they sent out two or three vessels every year in search of the land reported to exist to the westward of Ireland.

It is clear, then, that not only trading voyages were habitually made by English sailors over stormy seas out of sight of land, but that numerous voyages of discovery were despatched while the Portuguese

* "It is seven years since those of Bristol used to send out, every year, a fleet of two, three, or four caravels to go and seek for the Isle of Brasil and the seven cities according to the fancy of this Genoese" (Ayala).

were still cautiously creeping along the African coast, and long before Cabot appeared on the scene.

John Cabot was probably a Genoese, but he was domiciled at Venice from 1461 to 1476, married there, and became a Venetian citizen. He is then said to have visited Mecca; he went to Spain and Portugal, where he heard of the plans of Columbus for sailing westward to Cathay; and he appears to have been an experienced pilot and cartographer. He came to England, with his wife and three sons, at some time before the year 1496, but not long before, for he was probably in Spain at the time when the projects of Columbus were under discussion.*

On March 5, 1496, Henry VII. granted Letters Patent to John Cabot and his three sons, Lewis, Sebastian, and Sanctus, to fit out ships under the English flag, and to discover new isles and mainlands. His sons were all born at Venice, probably while their father was domiciled there to qualify for citizenship. Having obtained these important privileges from the king, John Cabot went to Bristol, the city whose seamen were inured to the navigation of stormy seas and accustomed to voyages of discovery. He had licence to take five ships, but, after more than a year of preparation, he only fitted out one small vessel, called the *Matthew*, according to Barrett,† with a crew of eighteen men. They were all Bristol sailors, except one Burgundian, and a barber from Castiglione, near Genoa. Soncino says that Cabot granted islands to these two adventurers. Joannes Ruysch, the Hollander (or German) who drew the very remarkable map in the Ptolemy of 1508, is said, by his commentator, Marcus Benaventanus, to have sailed from England to the coast of America. He may have been with Cabot, or in one or other of the two or three voyages sent from Bristol after 1498. The names (seven in number) on the "Terra Nova" in his map are, however, all Portuguese. The plan of Cabot was the same as that of Columbus, to sail westward until he reached the ports of Cathay and Cipango.

There is no account of the voyage at first hand, but a few details are given in three Italian news letters, written in London after the return of Cabot, two by Raimondo di Soncino to the Duke of Milan, and one by Lorenzo Pasqualigo to his brothers. There is also a statement in one

* Ayala, "He has been in Seville, and in Lisbon, procuring to find those who would help him in this enterprise." This must have been before he came to England, and after such an enterprise had been suggested to his mind by the success of Columbus. It has been conjectured that the visit of Cabot to Spain and Portugal took place between his first and second voyages. I think that the evidence is against this supposition. Pasqualigo speaks of him as living with his family at Bristol in the end of August. Soncino, writing in December, speaks of having conversed with him in the autumn, of his having constructed a globe, and makes no mention of his having been abroad. His new letters patent were granted in February. There was no time, amidst all his preparations, for a visit to Spain and Portugal, and no inducement to undertake it.

† 'History of Bristol' (1789), but Barrett does not give a reference to the document from which he quotes.

of the legends, on a map drawn by Sebastian Cabot in 1544. As the explorer returned early in August, and was absent about three months, he must have sailed on one of the first days of May.

The *Matthew*, then, set out from Bristol, on her memorable voyage, on May 2, 1497. Soncino, writing on December 18, 1497, reported that John Cabot passed Ireland, then shaped a northerly course, and finally navigated to the eastern (meaning western) part, leaving the north star on the right hand, and having wandered thus for a long time, at length he hit upon land,* where he hoisted the royal standard and took possession. Soncino had actually conversed with Cabot. Pasqualigo says that the distance was 700 leagues, which is about correct; that Cabot coasted along the land for 300 leagues and landed,† but saw no inhabitants; and that, in returning, he saw two islands to the right. Soncino mentions the enormous quantities of fish near the new land.

The legend on the map of Sebastian Cabot, drawn in 1544, further states that the land was sighted in the morning of June 24, St. John's day, and that the name of St. John was given to an island because it was discovered on the same day. On the map a large island, called S. Juan, is placed to the west of Cape Breton, in the position of the Magdalena group. The map shows Newfoundland as a detached group of small islands. The legend mentions the dress and weapons of the natives, gives a list of fish and birds, and asserts that there are many white bears and large stags like horses.

This exhausts the material for learning the history of the discovery of North America by Englishmen under the lead of John Cabot. There are the news letters of Soncino and Pasqualigo, written at the time; and the legends‡ and map of Sebastian Cabot, drawn up half a century afterwards. Soncino further reported that Cabot had drawn his discoveries both on a chart and on a solid sphere which he constructed; and the ambassador, Pedro de Ayala, mentions, in his despatch of July 25, 1498, that the chart had been sent to Spain.§ It

* "He has discovered two very large and fertile islands" (Soncino). "He set out from Bristol, a port in the western part of this kingdom. Having passed Ibernia, which is still further to the west, and then shaped a northerly course, he began to navigate to the eastern part, leaving (during several days) the north star on the right hand; and having wandered thus far for a long time, he hit upon land" (Soncino).

† "He says he has discovered, 700 leagues off, the mainland of the country of the Gran Cam, and that he coasted along it for 300 leagues, and landed, but did not see any person" (Pasqualigo).

‡ The legends on the map, according to Mr. Harrisse, were written by a Dr. Grajales, who received his information from Sebastian himself at Seville.

§ "As I believe your highnesses now have intelligence of all, as well as the chart or mappe-monde that this Genoese has made, I do not send it now, though I have it here" (Ayala, July 25, 1498).

"He has the description of the world on a chart, and also on a solid sphere which he has constructed, and on which he shows where he has been; and proceeding towards the east, he has passed as far as the country of the Tanais" (Soncino, December 18, 1497).

appears on the famous map of Juan de la Cosa (1500) as a coast-line running east and west, with flags showing its limits.

We will now, with the help of these meagre details, consider the position of the probable landfall of John Cabot. It will be seen, from the observations I am about to make, that some of my views have been modified since the publication of my introduction to the Cabot documents in the volume issued by the Hakluyt Society in 1893. Soncino was told that after passing Ireland he went north. As he intended to go to the west, it may be assumed that he was forced northwards by stress of weather, and that he resumed his westerly course as soon as possible. We may take it that he turned his ship's head west, in about the parallel of Blacksod bay, and held that course across the Atlantic. After passing the meridian of the Azores, there would be westerly variation, as Mr. S. E. Dawson was, I think, the first to point out, and magnetic west would really be W. by S. ½ S. The landfall of the *Matthew* would, under these circumstances, be Cape Bonavista, on the east coast of Newfoundland. Columbus also steered a westerly course, except for two days when he shaped a W.N.W. course, and for the last three days when he steered W.S.W. These two deviations from west about balance each other. The same amount of southing, caused by the variation of the compass, which took Columbus to Guanahani, would have taken Cabot to Bonavista bay. Taking Soncino's account of the voyage by itself, there can be no question that Bonavista bay, on the east coast of Newfoundland, was the landfall. The statement of Pasqualigo, that Cabot afterwards coasted along the land, is probable enough, though there was little time for a coasting voyage, and the exact distance of 300 leagues is a rough, and no doubt an exaggerated, estimate.

But there are the statements in the legend and on the map of 1544 by Sebastian Cabot. Mr. Harrisse rejects them altogether, on the ground of Sebastian's habitual mendacity. For those who are not inclined to go so far, there is nothing actually impossible in his statement that the landfall was at Cape Breton. Although a west course by compass would have taken the *Matthew* to Bonavista, she might possibly have been drifted, by wind and current, so as to clear Cape Race, though such a drift is very unlikely at that time of year. It is just possible that she might have passed Cape Race in thick weather without seeing it, and reached the point on Cape Breton island marked on the map of 1544 as "Prima Tierra Vista." Sebastian places a large island, called San Juan, to the westward, in the position of the Magdalena group.* The assertion of Sebastian Cabot that there were plenty of white bears on Cape Breton island, and his ignorance of

* This cannot possibly be Scatari island, as suggested by Mr. S. E. Dawson; for the San Juan island of Sebastian's map is to the west of the land.

the coast-line of Newfoundland, as shown by its delineation as a group of small islands, show that his statements are inaccurate and careless versions of what he had heard, and that he was not himself on board the *Matthew*.

The chart of John Cabot was, as we know from the ambassador's despatch, sent to Spain in 1497 or 1498, and was incorporated in the great map drawn by the pilot Juan de la Cosa, between April and October, 1500. There we find a continuous coast-line running east and west, without any regard to proportionate distance, which is excessively exaggerated. It must, however, represent the results of the first voyage of John Cabot, and cannot refer to the second, because the map had been sent to Spain before July, 1498. There are five flags, one at each extremity of the land, and three between them. Twenty-two names are given—one to a sea, three to islands, ten to bays, one to a river, and eight to capes; five being those of saints. This coast-line, copied from the chart of John Cabot, and running east and west, though so enormously lengthened out by Juan de la Cosa with reference to the European part of his map, appears to be intended to represent Cabot's delineation of the south coast of Newfoundland, plotted as the explorer sailed along it from Cape Race to Cape Breton, or from Cape Breton to Cape Race. The first point to the east, called "Cabo de Ynglaterra," would then be Cape Race. The large "Isla de la Trinidad" is Burin peninsula. A cape "de lisarto" is probably named from a fancied resemblance to the Lizard in Cornwall. "C. de S. Jorge" is Cape Ray, the most westerly point called "Cabo descubierto" is Cape Breton, and the deep bay between them indicates the channel between Cape Breton island and Newfoundland. I take this opportunity of mentioning that, at the suggestion of Admiral Wharton, made about ten years ago, this strait between Cape Breton island and Newfoundland received the name of Cabot strait, a name which has been generally accepted.

The saints after whom places are named on this coast-line are St. Gregory, St. Nicholas, St. Lucia, St. George, and St. John. Old discoverers generally gave the name of the saint on whose day it was first seen, to a cape or bay, and the days of St. Lucia and St. Nicholas were in December, that of St. George in April, while Cabot was sailing along the coast in July. But this rule was not invariable, for names of saints were also given to places because vows had been made to them, or because they were patrons of the discoverer, or of his relations or friends. The names were much corrupted in transcription and conversion into Spanish equivalents by Juan de la Cosa, and the coast-line drawn by Cabot was transferred to the Spanish map without much regard to scale or latitude. As Juan de la Cosa places Cuba and the Antilles well to the north of the Tropic of Cancer, such carelessness need cause no surprise. The coast-line seems to

indicate that the *Matthew* sailed along the south coast of Newfoundland.*

The two islands called S. Grigor and I. Verde, placed to the east of the Cabo de Ynglaterra (C. Race) on the map, may have been misplaced in transcription, and should be off the south coast, where they would represent the two islands seen on the right hand when Cabot was returning—the present islands of Miquelon and St. Pierre. These may have been the islands said by Soncino to have been granted by Cabot to his barber and to his Burgundian shipmate.

The first voyage of John Cabot is the first successful voyage of discovery which sailed from an English port. For those who can place credence in the statements of his son Sebastian, he passed Cape Race in thick weather, and made a landfall at Cape Breton on June 24. For those who reject the evidence of the map of 1544 and its legend, John Cabot made a landfall at or near Bonavista bay, not necessarily on June 24; then coasted along the south coast of Newfoundland until he was in sight of Cape Breton, returning nearer the land, so as to pass the islands of St. Pierre and Miquelon on his right hand. This coasting voyage would cover several hundred miles altogether, but not quite 300 leagues, as Pasqualigo has it; for we must take the coast-line shown on the map of Juan de la Cosa, running east and west, as a copy of the coast-line on Cabot's chart along which he sailed, being apparently the south coast of Newfoundland.

Much confusion has been caused, both by early writers and by their modern commentators, owing to the events of the two voyages of Cabot being confused together. The news letters of Pasqualigo and Soncino refer to the first voyage; the statements of Sebastian reported by Ramusio and Peter Martyr refer to the second voyage.

John Cabot received a grant of £10 for discovering "the new Ile" on August 10, 1497, and a pension of £20 a year was granted later, the first payment being made some time after Easter, 1498. Meanwhile he lived at Bristol, with his Venetian wife and his sons.† On February 3, 1498, fresh Letters Patent were granted to him by

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* The twenty-two names on the coast-line discovered by the English, on the map of Juan de la Cosa, are—

1. Mar descubierta por Ingleses (5th flag) (4th flag).
2. Cabo descubierto.
3. C. de S. Jorge.
4. lago fori.
5. anfro (3rd flag).
6. C. lucia.
7. S. Lucia.
8. Requilia.
9. lus-quei.
10. de lisarte.
11. Meniste.
12. Argare.
13. forte.
14. ro longo.
15. Isla de la Trinidad (2nd flag).
16. Cabo de S. Juan.
17. S. Nicolas.
18. Agron.
19. C. Sastanatre.
20. Cabo de Ynglaterra (1st flag).
21. S. Gregor.
22. I. Verde.

† Pasqualigo.

Henry VII., to take six ships for the further discovery of the new isles. Cabot still hoped, by sailing westward, to reach Cipango. The second expedition was also fitted out at Bristol. One ship was commanded by Lancelot Thirkill, of London, and he received a royal loan of £30 for its equipment. He returned safely, for he is mentioned as having repaid the loan on June 6, 1501. Thomas Thirkill also received a loan of £30. Thomas Bradley received a similar loan, and probably commanded another vessel. A third vessel may have been commanded by John Carter, who received a loan of £40 5*s*. All these are mentioned as "going to the newe ile." The expedition consisted of five vessels, with crews numbering three hundred men, and they sailed in the spring of 1498. Nothing more is heard of John Cabot. His fate and the date of his death are unknown, and there is not a scrap of his writing preserved.

The Spanish ambassador, Dr. Puebla, reported, in July, 1498, that the expedition had sailed, that it was provisioned for a year, and that it was expected to return in September. Don Pedro de Ayala added that one of the vessels had been forced to return to Ireland by stress of weather, with a friar named Buil * on board.

Sebastian Cabot, while he was in Spain as chief pilot, spoke of his father's second voyage as if he had not only commanded it, but fitted it out at his own expense. He told a gentleman, who related what he had heard from Sebastian at the house of Hieronimus Fracastor † (when Ramusio was present), that his father died at the time when the news came that Columbus had discovered the Indies, that the king fitted out two vessels for him in 1496, and that he discovered the land from 56° N. to Florida. He told Ramusio that he had been to 67° 30′ N. He told Peter Martyr that he furnished two ships in England at his own charges, and that he discovered the land from the sea full of ice to the latitude of the "Fretum Herculeum." Gomara and Galvano, who give similar accounts, appear to have copied from Peter Martyr and Ramusio. Sebastian Cabot, in making these statements for his own glorification, never mentioned his father except to say that he was dead before the voyages were made, and that he, Sebastian, fitted out and commanded the

* It has been suggested that this "friar named Buil" was identical with the Fray Bernardo Buyl or Boyl, who was appointed by the Pope to go to the Indies with Columbus in his second voyage. There is not a shadow of grounds for the supposition beyond a fancied resemblance in the name. Fray Bernardo returned to Spain in 1495, but he was far too important an ecclesiastic to have wandered away to England and embarked in one of Cabot's ships. He belonged to the monastery of Monserrat, and the name is Catalonian. *Buil*, in Ayala's letter, is no doubt a Spanish corruption of some English name.

† "My father died at the time when the news came that the Genoese Christopher Columbus had discovered the coast of the Indies. . . . I made my thought known to the king, who was well content, and fitted out two caravels for me with everything needful. This was in 1496, in the commencement of the summer. I reached the height of 56° under the pole."

expeditions. He did not stick to the same tale, telling the guest of Fracastor that the king fitted out two ships for him, and making Peter Martyr believe that he equipped them at his own expense.

Yet these are the only accounts, loaded as they are with falsehoods, which have come down to us respecting the second voyage of John Cabot. The probable modicum of truth is that the great navigator, or the English captain who commanded after his death, went north along the coast of Labrador until his progress was checked by ice, and then south as far as Cape Hatteras. We know that one of his captains, Lancelot Thirkill, returned home safely. We also know that the consort of Gaspar Corte Real returned to Lisbon in October, 1501, from the North American coast, with a piece of a broken sword gilded, which was certainly made in Italy, and reporting that two silver rings of Venetian workmanship were seen in the possession of a native boy.* These must have been left by Cabot's people in 1498.

It is very doubtful whether Sebastian Cabot accompanied his father on either of his voyages. In 1521 the Livery Companies of London were required by the king to fit out five ships for a maritime expedition under the command of Sebastian. The companies remonstrated, the Warden of the Drapers being their spokesman. He said that Sebastian Cabot was not born within the realm of England, and that he was never in the new found land himself, "though he makes report of many things he had heard his father and other men speak of in times past." The warden would not have dared to say this if Sebastian Cabot, who was then in England, could have disproved it. The contemplated expedition never sailed. There is not a particle of evidence that Sebastian did go with his father, except his own statement on the map of 1544, that the new land was discovered by John Cabot and Sebastian Cabot his son. His own stories told to the guest of Fracastor and to Peter Martyr were that he commanded the expeditions, which we know to be false. It is not improbable that he or one of his brothers would have accompanied their father, but, in the absence of any evidence that he did, I think that the statement of the Warden of the Drapers must be accepted as true.† Yet for centuries Sebastian Cabot has robbed his father of his fame as a great discoverer, and has been lauded to the skies as an Englishman born in Bristol who discovered North America, and was the founder of our maritime greatness. The diligent research of Mr. Harrisse and others has now exposed this imposture. Sebastian Cabot was born at Venice, probably while his father was domiciled there to

* Pietro Pasqualigo to his brothers, from Lisbon, October 19, 1501.

† "And we thynk it were to sore a venture to joperd v shipps with men and goods unto the said iland upon the singular trust of one man callyd, as we understand, Sebastyan, which Sebastyan, as we here say, was never in that land hym self, all if he make reporte of many things as he hath hard his father and other men speke in tymes past" (Report of the Wardens of the Mercers and Drapers, March 11, 1521).

qualify for citizenship,* and it is doubtful whether he even accompanied his father on his voyages across the Atlantic.

John Cabot was the first to lead Englishmen across the Atlantic, and his voyage must therefore be ever memorable. But he was not the originator of English voyages of discovery. A very gallant voyage of discovery was led by Thylde, a scientific English sailor, sixteen years before, which was followed by several similar voyages. English sailors had long been accustomed to sail across stormy northern seas to Iceland and Norway, and in search of the western land. But their knowledge of navigation was not equal to that of the seafaring peoples of the Mediterranean shores, or of the Portuguese at that time. They were apt scholars, and in a very short time they surpassed their masters; but in 1497 the British seamen crossed the Atlantic for the first time, under the guidance of a Genoese pilot, whose great achievement will be commemorated this year, the four hundredth since his discovery, in the dominion of Canada and in Newfoundland, as well as in England. We can only form a judgment of the character of John Cabot by the light of the very few facts that are recorded. He was a scientific seaman and a good cartographer, energetic, brave, and persevering, for these qualities were necessary for the accomplishment of the enterprise he undertook. He must also have combined his practical abilities with imagination and some enthusiasm. A foreigner, and at first unknown, he must have possessed the faculty of winning the confidence of his men, and of gathering round him the most able and daring seamen of the time. John Cabot probably died early during the progress of the second expedition, as he is not heard of after the ships left Bristol. The credit of completing that most important voyage, which gave to England the whole eastern coast of North America by right of discovery, therefore belongs to the English captains, probably led by Lancelot Thirkill, who certainly brought his ship back to England.

The discovery of North America by English seamen under the lead of John Cabot was followed up by voyages in 1501 and 1502, for which Letters Patent were granted to Richard Ward, Thomas Ashurst, John Thomas, and Hugh Elliott of Bristol. Other voyages followed; there was then an interval of comparative neglect, but Henry VIII. sent two expeditions to America, and in the time of Queen Elizabeth the merchants of the western ports of England employed a fleet of small vessels on the Newfoundland fishery. This trade became the great

* Mr. Harrisse has made researches and inquiries which lead him to the conclusion that letters patent were never granted to minors. In that case, Sebastian was certainly born while his father was domiciled at Venice to qualify for citizenship. Under any circumstances, his own earlier statements, and all the probabilities, show that he was born at Venice, and cannot be counterbalanced by the single statement of Eden that Sebastian told him he was born at Bristol. Sebastian's habitual mendacity deprives any such statement, if Eden reported it correctly, of any weight. The Warden of the Drapers reported that Sebastian was not born within the realm of England.

nursery of seamen for our navy, and Sir Walter Raleigh said, "The Newfoundland fishery is the mainstay and support of the western counties. If any accident should happen to the Newfoundland fleet, it would be the greatest misfortune that could befall England."

At length, through the patriotic enterprise of Sir Walter Raleigh, aided by the indefatigable labours of Richard Hakluyt, a colony was planted in Virginia, followed by others, until the complete foundations were laid for the rise of the great republic of the United States. The first link in this long chain of events was forged by John Cabot when he led British seamen across the Atlantic in 1497. The dominion of Canada, Newfoundland, as well as the United States of North America, all the people of English origin on the western continent, must look on John Cabot as their Columbus. It is well, therefore, that we should commemorate the fourth centenary of his voyage, and that we should join with our brothers across the Atlantic in doing honour to the memory of the great Genoese pilot, who was the first to lead English seamen over the wide ocean to the western continent.

It is, however, necessary, if any good purpose is to be gained by it, that all should be united with regard to the nature of the celebration. It looks as if unanimity cannot be obtained on the question of the landfall. Labrador must be rejected as out of the question. Those who reject the evidence of the map and legend of 1544 properly maintain that Bonavista bay was the landfall; while those whose faith in Sebastian Cabot is unshaken, will continue to believe in the Cape Breton theory. All the facts that are ever likely to be known are before us, but men will continue to regard them from different points of view. If unanimity is to be obtained—and it seems most desirable that there should be unanimity in the celebration of so momentous an event—the landfall should not be its pivot. The Royal Society of Canada, in celebrating the voyage of John Cabot, has, therefore, wisely determined to avoid debatable ground, and simply to pay a tribute to the great navigator, by placing a brass tablet in the Legislative Hall at Halifax, Nova Scotia, where advocates of every view can meet on common ground. The tablet, which will be inaugurated at Halifax next June, will have the following inscription :—

"This tablet is in honour of the famous
Italian Navigator, JOHN CABOT,

who, under the authority of letters patent of Henry VII., directing him to conquer, occupy, and possess for England any lands he might find in whatever part of the world they be, sailed in a Bristol ship, the *Matthew*, and first planted the flags of England and Venice, in the June of 1497, on the north-eastern seaboard of North America, and by his discoveries in this and the following year, gave to England a claim upon the continent, which the colonizing spirit of her sons made good in later years.

"This tablet was placed in this hall by the Royal Society of Canada, in the June of 1897, when the British Empire was celebrating the sixtieth anniversary of the accession of Her Majesty Queen Victoria, during whose

beneficent reign the Dominion of Canada has extended from the shores first seen by Cabot and English sailors, four hundred years before, to the far Pacific coast."

The Newfoundland Cabot Committee has decided to improve the signal-station at St. John's, and to erect an observatory there. Another suggestion, that any permanent memorial of the fourth centenary of the first voyage of Cabot should have Cape Race for its locality, also seems to have much to recommend it. It is between the two landfalls. It must have been a prominent object in the voyage. It is the "Cape of England," named by Cabot himself if, as seems probable, the coast-line and names of Juan de la Cosa were copied from Cabot's map. On Cape Race might stand the memorial, the "Cabot Lighthouse," an improvement or adaptation of the present one, lighting the great navigator's successors, on their way across the Atlantic, for ever.

After the reading of the paper, the following discussion took place:—

Mr. G. R. F. Prowse: The paper so fully covered and impartially described all that we know about Cabot that we naturally turn to the one debated point, his landfall. It was suggested by a fellow-colonist of mine that there should be a meeting in St. John's of the debating societies there, and that the question of landfall should be discussed and settled once for all. Well, I hardly think even this learned Society will dare to take that course! I would like to first mention another closely connected subject, *i.e.* was Newfoundland and the north-east coast of America known before Cabot went there, or did he know of it when he sailed? Dr. Winsor considers it very probable that whalers were on this coast before 1497, and also the Cantiño map, so perfect that it could hardly have been completed between 1497 and 1502. Other writers believe that the inhabitants of the Azores were on the banks of Newfoundland before Cabot. Mr. Beazley points out that the Azores were the dowry of the Duchess of Burgundy, and it seems to me that this Burgundian who went on the voyage with Cabot was probably an Azorean, employed, not because of any prior knowledge of Newfoundland, but simply for his nautical skill. I don't hold Dr. Winsor's view; there are physical reasons against it. I consider, and others have considered, that the field ice in the spring and the polar ice later separated the new world from the old quite as effectually as the Sahara separated the north from the rest of Africa. I also consider that the Cantiño map can be reconstructed synthetically from other maps. I think, when we examine the accounts of the voyage, there is an undercurrent of disappointment at its results. Certainly the Bristol seamen were going out again to fish, but Cabot was not satisfied with that, and I think there would hardly have been such public rejoicing at the finding of the "new" land if it had been known before.

As regards the landfall, the President has mentioned the most likely one, Bonavista, but it is not impossible that Cape Breton could have been reached. Labrador does not need much discussion; it has been pointed out by Dr. Dawson that the fish do not reach northern Labrador during the time that Cabot could have been there. We have, therefore, only the two traditional landfalls, Cape Breton and Bonavista, to consider. The legends on the Cabot map do not to my mind agree with the known facts. For instance, at the side of the map the land is described as sterile; that is not what Cabot found. Now, as regards Bonavista, there is a tradition in Newfoundland that it was the landfall. It is supported by a map (Mason's) in 1617, also by a map in Paris by Du Pont, on which (if it does

not refer to Bonavista, it can refer only to Newfoundland) *prima inventa* is written in red ink very close to Bonavista. Inside Bonavista bay exists to-day a place called King's cove, which is evidently where an English standard was set up; there is also a little cove called Keels, where the ship first struck the ground—this clearly cannot be of Portuguese origin. Castileon is possibly the old name of the place now known as Castle bay, and I think it may refer to the island given to Castiglione, Cabot's barber. There is also, on one of the early maps, an isle of St. Zachary, a Venetian saint, and there was a river Jordan, and still is to-day a Moses island—whether Newfoundland is like the promised land, I won't say! it is certainly England's oldest colony, and I hope some day may be a prosperous country. I have examined every map in Paris and London to see if I could discover anything more definite, and the results are disappointing. I think I can trace nearly all the other voyages, the second voyage of Cabot, and the first and second of Corte Real, and the Breton voyage in 1504, but there is no direct evidence of the first voyage of Cabot.

Before sitting down, I cannot avoid disagreeing with the President in his view of the Cosa map. To my mind it is, though made in 1500, a comparatively late type of map representing a voyage rapidly made in 1499 along the south coast of Newfoundland (which terminates at the third flag)—along, in fact, a coast already delineated (cf. the Oliveriana map), and then what I take to be the real object or result of that voyage commences to be shown on the Cosa map, namely, the circumnavigation of the gulf of St. Lawrence. I think those who compare this map with the map of Gaspar Viegas and that in the Riccardo library, will see the coast-line of the gulf is exactly the same in the three maps. In the Cosa, then, we have a map showing the western coast-line of Newfoundland for the first time, a coast-line conspicuously absent in the Cantiño, Sevillian, and other early groups. I take it that this map, which shows *more* coast, cannot be a copy of Cabot's first chart. My own opinion is that Bonavista and the coast north of it was the part seen on Cabot's first voyage, but I would not, however, like to put it stronger than that that is the least unlikely part of North American discovery.

Colonel G. E. CHURCH: The main object of our President, in giving us a paper on the first voyage of John Cabot to America, has probably been to invite debate, with the hope that, from the mist and mystery which surround that voyage, some truth may be evolved.

It is stated that Cabot's ship sailed May 3, 1497; that she made a landfall in the New World, June 24. She must have arrived home again about August 5; for on August 10, 1497, we find the king giving Cabot a reward of £10 for his discoveries. Continents were cheap in those days! If these dates be correct, it may be doubted if Cabot made the voyage attributed to him. His ship was small—a crew of eighteen men. His voyage out and back lasted but ninety-four to ninety-five days.

At that period the best speed of an Icelandic or a Norwegian ship was held to be 120 miles "for a day and night," sailing before the wind. In 1492, the ships of Columbus made the voyage across the Atlantic, from Gomara island to Guanahani island, in thirty-three days, a distance of 52°, measured on the arc of a great circle. This gave an average daily speed of 94½ geographical miles. The route offers one of the most beautiful voyages of the world—smooth seas, fair trade winds, and favourable currents. It is not conceivable that Cabot was equally favoured in his transit of the stormy, moody north Atlantic, or that he could have averaged over 60 to 70 miles daily. But let me accept the latter figure. Pasqualigo says that the outward voyage was 700 leagues. What was a Venetian league? I have made some effort to ascertain, but the result is unsatisfactory. There is evidence that there were 72½ to a degree; but, going into

details, I cannot make over 16, which is probably correct. Moreover, measurements were then based on fours and their multiples. Adopting 16, the 700 leagues become 2625 geographical miles. The distance, direct, from Bristol to the coast of Labrador is 31° 30′ = 1890 miles.

The following estimate is of interest:—

700 Venetian leagues	2625	miles.
Return voyage	2625	„
Total	5250	„
At 70 miles daily	75	days.
Exploring 300 leagues of coast (during daylight) = 1125 geographical miles, at the rapid rate of 30 miles per day	37½	„
Hunting, fishing, provisioning, and repairing ship	30	„
Total	142½	„

as against the ninety-four days allotted to him.

Had he sailed out and home with all the favourable circumstances which attended the voyage of Columbus—94½ miles per day—his total days' absence would have been 123.

If we abandon Pasqualigo and his 700 leagues, eliminate the possible route *viâ* Iceland, and make the voyage direct, from Bristol to Labrador or to Bonavista bay, we have, out and home—

3780 miles at 70 miles daily	54	days.
Exploring 300 leagues of coast	37½	„
Provisions and repairs	30	„
Total	121½	„

against the ninety-four allotted.

If June 24 be accepted as the day Cabot made the landfall, the calculation runs even worse—

Exploring 300 leagues of coast	37½	days.
Provisions and repairs	30	„
Return home direct, 1890 miles, at 70 per day	27	„
Total	94½	„

against the forty-two days which remained to him up to August 5, 1497.

Permit me to suggest that the length of Cabot's voyage was *one year and three months*, not the apparently impracticable period of time which has been assigned to it, and that he sailed in 1496, and returned in August, 1497.

My friend, Mr. E. J. Payne, and myself, have, at the Public Record Office, examined the roll containing the original record of the patent granted to John Cabot and his sons, authorizing them to make the voyage which we have under discussion this evening. It is dated March 5, 11 Henry VII.—that is, 1496. The eleventh year of Henry's reign was from August 22, 1495, to August 21, 1496. The membranes forming the roll are not stitched together in the sequence of their dates, and the patent referred to does not show the year on its face, which raises a doubt as to its being the 11 Henry VII.; but, fortunately, we inspected the back of the membrane containing it, and, on the upper margin, found, clearly written, in the same hand as the body of the instrument, "*Regis Henrici, Septimi, undecimo XI. XI. XI.;*" the several times repeated year making it irrefutable that the patent bears date 1496.

We also examined the petition of Cabot, which is of equal date with the Patent, and the terms substantially the same, both having probably been agreed upon before they were formulated. It was easy for a merchant of the wealth and position

of Cabot to enlist any support he may have solicited to fit out a ship which he himself was to command. His eager wish to solve the riddle of the West had impelled him to successfully spur the bold sailors of Bristol to fit out several expeditions for this purpose during his residence there. But now the great Cabot was to sail in person. Everything must have urged him to prompt action. The voyage of Columbus had set maritime Europe ablaze with the desire to seize any advantage which might arise from the rediscovery that the Earth was round. Was it probable that Henry VII. would, under such exciting circumstances, allow Cabot fourteen months to organize his expedition of only a single little craft, and thus leave England behind in the race for commercial power? Was Cabot the man to risk everything by delay, and let the prize fall into Spanish hands? Two months would be ample to fit out his ship. It is not difficult to believe that he set sail in early spring—perhaps May 3, 1496, and that his route to America was *viâ* Iceland. Bristol then had a large trade with that island in breadstuffs, beer, and liquors, which were exchanged for fish. The merchant, Cabot, might find it profitable to take a cargo *en route* to America, and lay in fish as provision for his crew. Moreover, the literature of Iceland teemed with accounts of voyages to Greenland, and thence south-west, since the days of Eric, Biarne, Lief, and his brother Thorwald; and as late as 1347, the records showed a voyage made to America by a small ship, with a crew of seventeen men, as if it were a common occurrence. Information of enormous value for Cabot's purposes awaited him in Iceland, and nowhere else to the same extent. Columbus went to Iceland for the same information, making a special voyage for the purpose. Why should Cabot neglect to avail himself of it when the island lay almost in his track? The main object of the expeditions of those days was to reach Cathay and Zipango by sailing west. Nobody then dreamed that an immense continent intervened. The map of Antonio Zeno, year 1400, showed Greenland to connect with Europe, and between Greenland and Labrador a vast strait extending north-west. It was the standard map of the north Atlantic during the fifteenth century. Cabot, as a renowned cartographer, must have been familiar with it. He would reach that strait, navigate it, and give to England the commerce of Oriental Asia. This, I believe, was the primary object of his voyage.

Soncino says, "Passato Ibernia più occidentale e poi alzatosi verso el septentrione, commenciò ad navigare ale parte orientale, lassandosi (fra qualche giorni) la tramontana ad mano drita," which I translate: "Having passed to the west of Ireland and running to the northward, he commenced to navigate towards Oriental parts (for several days), the north on his right hand."

I agree with Mr. Payne that *Oriental parts* means Eastern Asia.

The distance from Bristol to the coast of Labrador is, *viâ* Iceland, 40°, or 2400 geographical miles, or 640 Venetian leagues, by great circle sailing; but, allowing for deviations in sailing, it would be about the 700 leagues which, it is stated, Cabot sailed on his outward voyage. We have seen that the direct distance is but 31° 30′, or 504 Venetian leagues, and that it makes but little difference to my argument whether the voyage was direct or *viâ* Iceland.

I am pleased to note that Mr. Payne, in his splendid 'History of the New World,' also believes that Cabot sailed from Bristol in 1496, but thinks that he wintered in Iceland. As to the latter, I am not disposed to agree with him; for I do not think that Cabot would have spent all the summer of 1496 and the succeeding winter there, when the object of his voyage, by so doing, might have been defeated. I believe that he collected his desired information, and proceeded as rapidly as possible, reached the coast of Newfoundland or Labrador late in June of 1496; then, true to his purpose of reaching "Oriental parts," sailed north-west

up Davis straits until stopped by cold and ice, then turned south and examined the coast of America, at least as far as Cape Hatteras, just as Juan de la Cosa indicates on his map, published in 1500, as being the country explored first by *los Yngleses*. The two islands which Cabot saw on his right, as he returned home, were probably Martha's Vineyard and Nantucket, both of which I know well. They lie to the south of Cape Cod, and perfectly represent the description of Soncino as being "fruitful, temperate lands." The island further west, and called "Isla de la Trinidad" by Cosa, is, I take it, Long island, 120 miles in length.

Here I cannot neglect to quote Sebastian Cabot's statement to the "Mantua gentleman." "In 1496, in the beginning of July, I sailed towards the north-west . . . found that the land ran northwards . . . coasted to the 56th degree, but, seeing the coast turned towards the east, I sailed southwards as far as Florida" (see Harrisse). Was Sebastian always "mendacious"?

Pasqualigo says that Cabot was "three months on his voyage," and "returned in August, 1497." Perhaps here lies the source of what I believe to be the error of four centuries. Very likely the return took three months. Is this what he meant?

If we limit Cabot's expedition to a short summer visit to lands which had been well known to the northmen for nearly five hundred years, it becomes commonplace; but, if my arguments be examined and found tenable, his voyage swells in proportions and dignity, and may well be classed as a great national achievement.

Mr. E. J. Payne: The one thing which appears to be certain, in connection with Cabot's voyage, has been vividly brought before us in the President's admirable paper—the fact that it was made, not by Sebastian Cabot, as Sebastian alleged, and as is commonly supposed, but by his father, John Cabot, who obtained a charter in March, 1496, sailed to some part of America, described as the "New Isle," and returned in August, 1497. Although the details of the voyage were freely talked about at the time, no precise record of them appears to have been kept, and his exact course and landfall are to a great extent matters of conjecture. The view usually taken is that the whole voyage only occupied three months; and, if this were so, Cabot must have taken a direct course to Newfoundland soon after passing Ireland, in the manner which the President has described. Now, this view is founded on a single scrap of evidence; when Cabot came back he "said that he had been three months on his voyage." This is much more likely to have been meant to apply to his return voyage only than to the whole voyage. The antecedent probability is in favour of his having sailed in 1496; and Colonel Church has shown, I think, very clearly that he could not possibly have done what he is said to have done in three months. I do, for my own part, firmly believe that he availed himself of the knowledge of the Western continent which was current in Iceland, in consequence of the voyages of the old Northmen, and through Iceland current in Bristol, and that he reached America by way of Iceland and Greenland.

We know that for years and years before Cabot's voyage seamen had sailed every year from Bristol, for the island of the Seven Cities, and we know that they all failed. We have John Cabot setting out from the same place in 1496–97, and coming upon the New Land in the western ocean. According to the ordinary view, he was simply more persevering than his predecessors. I cannot help thinking that, on the contrary, he took a totally different course, and that his voyage was, in truth, a Northman's voyage. We know as a fact that he started northward, and after a time he turned to the west, making, as Soncino's letter in my opinion very correctly states, for the "eastern parts." Although Cabot's course was westward, it was directed towards the "eastern parts" of Asia, like all other voyages of the same class; and the shores for which he was making are therefore correctly described as the eastern parts. He reached America after making a course estimated at 700

leagues. Colonel Church has measured this on the globe, and finds that it corresponds with the route by Iceland and Greenland, bringing him by Cape Farewell to the coast of Labrador. In addition to this, we have the explicit statement made by Gomara in his 'Historia de las Indias.' Gomara says, in so many words, that Cabot took "the route of Iceland" ("la vuelta de Islandia"). There is another thing which should not be forgotten. The land discovered by Cabot became forthwith known in England by the very name given to it in Icelandic tradition, the "New Land" (Nyjaland), or New Found Land; and this name has been applied to it ever since. The knowledge of the New Land which had been reached by the Northmen centuries before was not confined to Iceland; it had long been widely popularized in Europe generally through a geographical tract written by the German priest, Adam of Bremen, in the eleventh century, in which it is treated as a matter of common knowledge. We ought not to forget that Frobisher, who some years afterwards sailed for the "eastern parts," followed this northern route. He went by way of the Færoes, Greenland, and Labrador; this seems to be evidence of a current impression that the "eastern parts" would be most directly reached, as indeed they are, by a somewhat northward course rather than by one due westward. Whatever view we may take of the matter—and it must always be a matter of controversy—we shall all cordially agree that great light has been thrown upon it by the President's admirable address.

The PRESIDENT: Colonel Church pleads very strenuously for time, as the geologists used to do in former days, and it is quite possible that geographers may be obliged to concede it to him. It is a new theory to me, and I think probably to most people in this room, that Cabot passed a year and a half instead of three months on the voyage, and that he went round by Iceland. Of course it must remain a mere matter of conjecture, for the figures and facts of Pasqualigo can never be looked upon as more than gossip of a news-writer. So that the difficulty in which we are placed in regard to this very puzzling voyage is that we have no facts which are really sufficiently established to found a solid argument upon. It must be remembered that Sir Martin Frobisher's voyage took place nearly a hundred years afterwards; the whole of that coast had been explored when he was seeking the north-west passage, while Cabot was seeking a south-west passage. However, at this late hour of the evening it is impossible to go much into detail, and I think it only remains for me to propose a very hearty vote of thanks to those gentlemen who have so kindly joined in this discussion, which has been extremely interesting.

Colonel CHURCH: I think we ought to propose a vote of thanks to our President for giving us the opportunity to have this debate.

FURTHER NOTES ON THE TRIPOLI HILL RANGE.*

By H. S. COWPER.

PART I.

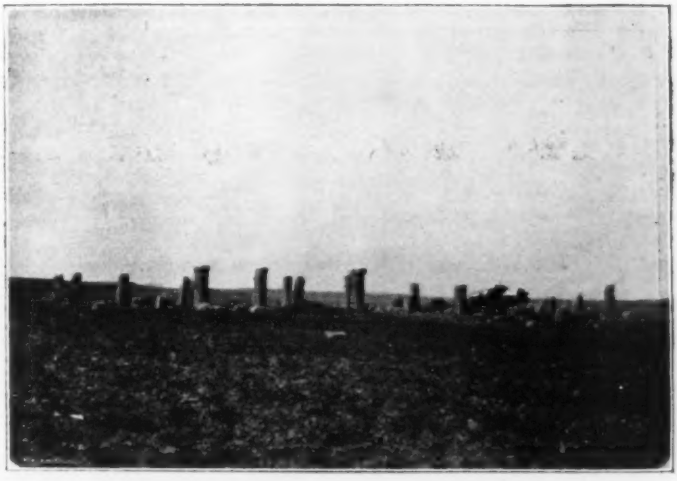
A Ride from Tripoli to Khoms and Wadi Targelat, through the Districts of Tarhuna, Jafara, and M'salata.

THE short journey I took this year through the Tripoli hills, had, like that of the previous spring, as its chief object the investigation of the remarkable megalithic sites which are so numerous in this part of the Barbary coast; and as, under the present *régime*, excavations are out of

* Map, p. 692.

the question and travel difficult, I devoted my energies to trying to ascertain rather the geographical limits of the series than to making careful studies at any individual sites. I accordingly left Tripoli on March 2, with a small party of four Arabs, and my baggage on donkeys, and for the first two days I pursued a route coinciding with the previous year; so that on the second evening we camped on the outer slopes of the Tarhuna hills, some miles east of Fum Doga, and opposite the Fum Terrgurt, or mouth of the wadi of that name, which is the next important valley running through the hills.

The following morning was devoted to visiting some sites just outside



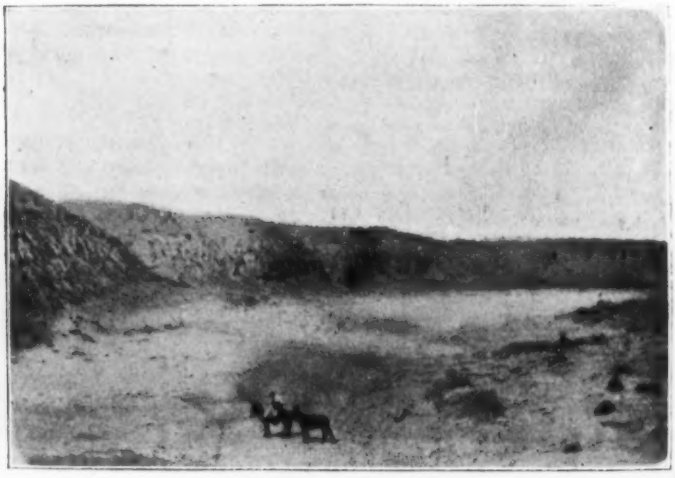
SENAM SEMANA (TERRGURT).

the "fum," lying on a part of the slopes of a district called Jeabin, which extends from here south-east, and forms part of the Jafara country, which reaches to the sea. I should mention that one of these sites, called Semana, was the most remarkable of the whole series examined, for there had been originally no less than eighteen or twenty megalithic trilithons in a line, each with its massive altar placed before it. My guide not inappropriately remarked, "This must be the Medina (the capital)."

A few miles up the Wadi Terrgurt I was compelled to desist from the examination of another remarkable site in consequence of the threatening character of the local Arabs. It appeared that within and close to the walls of this ruin were the shrines of several merabuts, or saints; so that my appearance with note-book and measuring-tape collected a party of tribesmen, who were soon worked up into a

condition of ungovernable fury. In this dilemma my guide decamped with my camera, without my being enabled to take a single photograph. Fortunately, I had time for a few notes and measurements before this occurred.

The Wadi Terrgurt, like the adjacent valley of Doga, forms one of the principal routes into the Tarhuna hills. Near its "fum," or outlet, it runs between clay cliffs, but higher up these are exchanged for rocky slopes. At some 8 or 10 miles from the "fum" it is joined by a tributary watercourse, the Wadi Guman, running from the south-west. A little way above the junction of these two wadis a prominent landmark is the hill called Ras el Guman, a bold isolated eminence dividing the two.

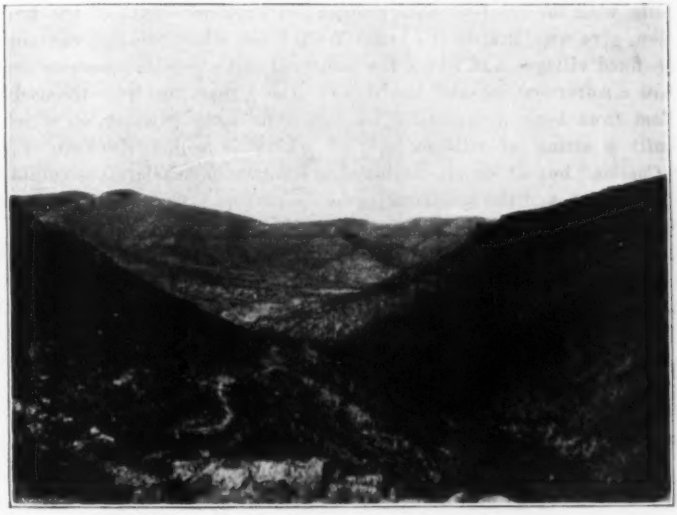


WADI TERRGURT ON THE PLAIN (LOOKING NORTH).

On the fourth day my route left the Wadi Terrgurt, and led me up Wadi Guman, over the backbone of the Tarhuna hills on to the plateau. The road over this pass proved extremely rough and difficult, and before we reached the summit, which was about 1400 feet above sea-level, we had been compelled to halt six or seven times in order to replace the baggage, which was being continually torn from the backs of the donkeys by the projecting rocks. At last, after passing a bubbling streamlet, pouring from a small wadi on the right, near which we observed the remains of Roman dams, we saw in front of us the rolling plain on which I had camped the previous year. Before us was the dip through which the upper course of the Wadi Targelat meandered, and away to the right the tiny sanctuary called Sheikh el Madeni.

The following day, after some not very profitable diggings round the

altar of a Senam here, I turned south-east to the districts named Ghirrah and Mamurah, through which runs the great Wadi Targelat, the upper course of the Cinyps of classic days. These districts, which lie south of the Ferjana plain described in my former paper, form a series of wide valleys undulating and green in character, and running towards the sea at Kam. These valleys, which have no deep ravines in them, are all branches of the Targelat, but go by the names of the districts they traverse. Thus we have Tergelat mta Ghirrah el Kebir, and Targelat mta Ghirrah el Saghir, and also Wadi Bu Samida, apparently a branch course. Below to the south-east we come to Targelat mta Mamurah. Hereabouts, although the pasturage is fairly good, population seemed thin and tents few, though lower down, where it approaches the sea, it



WADI GUMAN (LOOKING NORTH).

is said to be rather thickly inhabited. Here I had a great disappointment, for my guide refused to accompany me further than Mamurah, whereas I wished to proceed by the wadi direct to Kam; the population, he said, was thick, and bore too bad a reputation to venture through without a Government escort. As during both my excursions in the hills the behaviour of this man had given me thorough confidence in his knowledge of the country, I could not well disregard this advice, so that reluctantly I was compelled to abandon the idea.

On March 7, therefore, I turned back to the Ferjana plain, where we found numerous sites not visited the previous year, and soon were in sight of the small ruin which caps the summit of Jabel Msid at the

boundary of Tarhuna and M'salata. The peculiar desolate aspect of these uplands about Ferjana is very striking, for, while there is hardly a tent to be seen, and barely any cultivation, the eye is struck by the strange ruined megaliths dotted over the plain, almost wherever one looks.

An hour before noon we reached Senam el Nejm, and thence I followed the route taken before, through Wadi Daun and the Kseia, until I reached Jebel Msid. We passed over the southern shoulder of this hill, and thence descended into the wide and beautiful valley of Ueni in the Kaimakamlik of M'salata.

Jebel Msid forms the last spur of the hill range to the east, and the traveller who makes his way to the coast at Khoms, or Tabia (Kam), gets a total change of country as he proceeds. The barren, treeless hills, with the dried-up watercourses and scattered tents of the tribesmen, give way, first to the broad Wadi Ueni, which, though containing no fixed villages and but a few scattered olive groves, possesses somehow a softer outline and less dreary aspect than the hills themselves. East from here is reached a tract of undulating country, on which is built a string of villages, one of which is called Kusabat, or the "Castles," but which, all combined, are known as M'salata, the capital of the district, and the residence of the Kaimakam. Crossing these slopes, we see everywhere that we are returning to civilization, or rather to settled life. Olive groves become more numerous, and amidst them nestle little houses of masonry. Lines of camels with their awkward loads of halfa converge by the various routes, which, winding from the different parts of the hills, join hereabouts and journey to the little port of Khoms, the centre of the trade on this part of the coast. Among the groups of Arabs we pass, it is not difficult to discern townsmen of M'salata or Khoms, whose less ragged costume and paler faces easily distinguish them from the wild tent-living Arabs only seen in the hills.

At four hours' ride from Khoms we suddenly arrived at a ridge, from which a wide panorama of coast and sea presented itself. From this point, some 500 feet above the sea, we looked over the most sterile and barren slopes imaginable, and I found it difficult to believe that I was gazing over the country which at one time formed the environs of the rich and flourishing city of Leptis Magna. From here the chief points in the landscape were a cape to the north of Khoms, and the Mergub hill with its ruined arch and castlet (probably a watch-tower and semaphore station of the Romans); but Khoms itself and the actual site of Leptis were invisible in consequence of intervening slopes. Away to the south-east could be traced the low coast-line about the mouth of the Targelat and Zliten.

From here to Khoms the country is thickly sprinkled with Roman ruins, which bear witness to the widespread influence of Roman Leptis; while numerous Senam sites, though mostly ill-preserved, show that the

builders of the megaliths occupied the country down to the coast. As we rode towards Khoms our attention was arrested by a noise of firing at some tents, followed soon after by the departure of a considerable party of Arabs, some mounted and some on foot. This proved to be an organized expedition against a gang of thieves who had attacked or plundered these tents, and the gun-firing was a signal to summon the tribesmen.

Brief as my ride had been, I was enabled to visit or note a large

SENAM EL-KHAB (M'SALATA).

number of megalithic sites. In the Wadi Terrgurt they proved to be almost as numerous as in the adjacent Wadi Doga, while in the upper part of Wadi Targelat they cluster thickly. My guide stated that south of this they were less common, and that at no great distance they ceased to exist, but for this I cannot personally vouch. Those which were noticed in the vicinity of Khoms appear in most cases to have been altered or destroyed in Roman or Greek times; but it is a significant and curious fact that a Senam jamb remains *in situ* at a point which was probably included within the walls of ancient Leptis.

With regard to the geography of this country generally, it may be worth while calling attention to the paucity of any reliable information to be obtained from any modern maps. It may, indeed, be said that up to 1896 no map (if we except that of Dr. Barth) has ever been published which could be in any way useful to a traveller in this interesting little tract of country. Those which exist show a few places here and there, the positions of which were noted by Admiral Smyth and one or two others, but no attempt has ever yet been made to lay down correctly, or, for that matter, incorrectly, the physical features of the country. On Barth's map three or four wadis are shown, but the positions are by no means dependable, as, for example, the Wadi Terrgurt, which is shown running from Jebel Msid (M'salata), instead of from a few miles east of Wadi Doga. The War Office map of Tripoli is quite useless for this country, for in it even the place-names on the coast are in most cases, where I have been able to check them, incorrect or blundered in about three cases out of four.

At the little town of Khoms I remained about a week, partly in order to visit and make some examination of the adjacent ruins at Lebda (the ancient Leptis Magna), and partly to get an opportunity to visit Tabia, at Kam. Khoms is a tiny seaport of modern growth, owing practically its origin and present existence to the halfa or esparto export trade. The name Khoms is, properly speaking, a district one, but since its rise it has been generally applied by Europeans to the town; and since its existence is so largely due to European industry, it is perhaps only fair it should retain it. The Arabs, however, still usually call it Legateh, which is the name of the little headland close by, still retained on our Admiralty charts. European trade has adopted the spelling Homs, which is anything but satisfactory, as the Arabic initial is the guttural *Kh*, and the local pronunciation *Khummus*.

Tiny as the place is, it stands in marked contrast to the ancient capital of the Pashalik. Although in its rear lie the usual squalid Arab huts, the chief features of the town are the one or two wide streets, in which are the residences of the representatives of the halfa industries, the Turkish officials, and the telegraph company. The large barracks, the lighthouse, and the halfa yards all help to add a feeling of life and industry, which is hardly to be felt in the crowded alleys of the capital. One may almost venture to predict that, with its strong bracing air, its glorious climate, and the close proximity in which it stands to the historic ruins at Lebda, the little town of Khoms may some day (though perhaps a somewhat distant one) take a place among the minor Mediterranean health resorts.

The Cinyps country at Kam is dealt with in another part of this paper, and has also been visited and described in more or less detail by various writers. From Khoms it is about three and a half hours' ride, so that the mouth of the river lies about 12 miles distant from the ruins

at Lebda. The road passes most of the way through the Sahel, a plain covered with palm trees; and at about two-thirds of the distance the little village of Suk el Khamis is passed, where, as the name betokens, a regular Friday market is held. Twenty-five minutes beyond this there is a sanctuary called Merabut Ali es Seah.

A mile and a half or two miles before reaching the mouth of the Targelat, a headland juts into the sea, which, on the Admiralty charts and War Office map, is named Ras el Tabia. Locally, however, it is known as Ras Magro, and on it there are the tombs of two saints, one Magro, who, strangely enough, is said to have been a Christian, and the other, Si Hamed el Magrebi. Just beyond lies a huge funduk, or warehouse, built originally by a Maltee as a depôt for halfa grass, in the hope of opening up that trade at this point on the coast. From its proximity to Khoms and Zliten, the venture proved a failure, and when I visited the place I found it crowded with Greek sponge-fishers engaged in repairing their nets and sails. These men generally work at Tripoli, and it is only recently that they have made a trial at Tabia; and I learned that they had done well, in spite of losing several of their vessels. They were a picturesque and striking, although dirty, group; but, though Europeans, they had a far more rascally and thievish appearance than the white-robed Arabs we saw here, who, however, bear such a bad reputation.

This funduk is called Tabia by Europeans, but often by the local people the Marsa, or harbour. On our Admiralty charts, it appears (in an inset) under the name of Marsa Ugra, which seems quite unknown at the place, and is probably a blunder out of Marsa and Ras el Magro.

My return to Tripoli was made in an open halfa lighter with two Tunisian sailors—a method of travel, when with a good wind, more expeditious than luxurious. The sailors who manage these boats are always Arabs or Maltese, and thoroughly know their work, though they hug the coast all the way, ready to run ashore if the wind changes. In such a case the trip may be indefinitely prolonged; but if, as in my case, a fine favourable wind can be taken advantage of, it is soon over, and I effected the journey of 70 miles by night in 12½ hours—not bad travelling for a cargo lighter. For the traveller who wishes to visit Lebda and Khoms, and cannot wait for an esparto steamer, this is the best method to come from Tripoli: there is but little danger, except of the wind dropping; neither is there any degree of comfort, for the boats leak and are bailed all night. But the method is expeditious, and should be adopted in default of a better.

As we raced into Tripoli, I saw a cloud of dust lying over the Pianura, while the smoke of long Arab guns floated away to the sea. Ramadan was at an end, and 500 Arabs from the hills were celebrating its termination by the sport of Lah el Barud, or powder play.

Part II.

1. *The Physical Geography of the Hill Range.*

The hill chain of Tripoli may be said to commence on the east with the boundary between Tarhuna and M'salata, because between here to Leptis it falls away with gentle slopes. At this point we are about 15 miles from the sea, and from here the chain runs south-west to Nallut, where the distance from the coast appears about 90 miles. The intermediate portions are Gharian, Yefrin (the Beni Tefren of John Leo) and Nefusa; and as this last part is always known as "el Jebel," it is probably more truly mountainous in character than Gharian and Tarhuna.

The eastern portions of this range being those in which my own investigations took place, it may be of advantage to consider them a little in detail; and as the ancient sites I visited were only noted in any number between Wadi Wif on the west and Lebda on the east, the district we have to deal with is only small—some 60 miles in length; while from north to south, from the Jeabin district to Ghirrah in the Wadi Targelat, it measures only about 20 miles.

The physical characteristics of this region are sufficiently peculiar to merit notice. In the first place, the hill range is separated on the north from the sea by a district of gently undulating slopes, averaging, it would appear, some 8 or 9 miles in width, between which and the sea lies a sandy and inhospitable waste, which dies out to the east towards Khoms and Lebda. These slopes, inhabited by tribal semi-nomadic Arabs, like the hills themselves, are from 400 to 600 feet above sea-level.

The traveller approaching the true hill range from the north, whether at Tarhuna or Gharian, cannot fail to be struck by certain peculiarities. The hills are all nearly of the same level, so that the geographer finds it necessary to inquire the names of the various depressions which mark the outlets, or "fums," of the various wadis, where they emerge from the hills on to the slopes. So marked is the wall-like contour of the range, that we cannot resist the inference that at one time the sea covered both the desert strip and the slopes, and washed the base of these hills themselves.

Eastwards, however, this is less marked, for the country shelves off gradually from Jebel Msid to the sea at Khoms, and there are neither the cliff-like hills nor the desert patch.

On entering the range by one of the various wadis, the traveller will find a greater diversity of contour than he has been led to expect; for the hills, for some 10 miles from their northern boundaries, rise to a backbone from 1300 feet to 1600 feet above the sea. This is the crest or watershed of Tarhuna, and can be followed from Jebel Msid on the east along the hills at the heads of Wadis Doga and Guman to Jebel

Bu Tawil, whence it appears to run to Jebel Khasbm Aruf, a bold bluff which is plainly discernible from the house-tops at Tripoli, to which it is the nearest point in the hill range.

2. *The Wadis.*

Rising at the crest and running to the sea are a series of valleys, which, though now dry most of the year, are all the same valleys of erosion. They form the highways or tracks by which the tribesmen always approach or leave the hills for the coast. They vary in width, but are similar in character, and between Wadi el Haira, due south of Tripoli and Khoms, there appear to be about fourteen principal ones. These are, enumerating from el Haira on the west—

WADI TERRGURT IN THE HILLS.]

(1) W. el Haira; (2) W. Ismar, which joins the (3) Wadi Mejenin on the plain; (4) W. Libetr, which must be somewhere near, if not identical with, W. Melgha of our maps; (5) W. Serrt; (6) W. Raml; (7) W. Saghia; (8) W. Doga; (9) W. Dughun; (10) W. Terrgurt; (11) W. Karathie; (12) W. Msid; (13) W. Bin Jabara; (14) W. Gerim.

Of these, my own travels led me into parts of el Haira, Mejenin, Raml, Saghia, Doga, and Terrgurt (with its branch of Guman). But the other names are from information given by the natives, and should be received with caution, because Arabs frequently describe a wadi by the name of a district it traverses, and not by that of the watercourse itself.

Of these wadis Ismar, Libetr, Serrt, Doga, Dughun, Guman, and

Karathie appear never to have been noted by any traveller, or inserted in any map. On the other hand, Wadi Melgha, or Melghra, appears everywhere as the regular route to Beni Ulid, and, strange to say, though once or twice in the vicinity where it is supposed to lie, I could hear nothing of such a name. Terrgurt, Raml, and Msid are all known by name, as they reach the route on the coast from Tripoli to Khoms.*

WADI TERRGURT IN THE HILLS.

3. *The South Side of the Watershed.*

Crossing the watershed, we reach country of a different type; the chief feature in that part in which I travelled being the barren treeless plateau, about 1200 feet above sea-level, and therefore somewhat lower

* The information hitherto at hand is very confusing. In Barth's map, between Legateh (Khoms) and Tripoli, we have—(1) Gerim, 13 miles west; (2) Terrugert, 9 miles west of last (22 miles), and running from Jebel Msid, which is, of course, incorrect; (3) Msid, 5 miles west of Terrugert (27 miles); (4) Ruml, 4 miles west of Msid (31 miles).

The following distances of the same wadis at their outlets to the sea, according to a modern inhabitant of Legateh (Khoms), are in camel hours:—

1. [illegible]m
2. [illegible] Jabara ... ... 6 hours (15 miles).
3. [illegible]errgurt ... ... 8 hours (20 miles).
4. Msid ... ... 13 hours (32 miles).
5. Raml ... ... 16 hours (40 miles).

Wadi Msid is said to have no connection with Jebel Msid. Bin Jabara is Smyth's Benzbara. Barth mentions Wadi Benjafara, but says, "Smyth's Benzbara, which he seems to have confounded with Terrugert." Della Cella puts Msid 7 hours from Tajura. All these wadis seem to make a big bend east between the hills and the sea.

than the crest of the watershed. This plain, though relieved to the south by numerous low lines of hills, drops gradually, while to the south-west it extends 20 miles to the western Tarhuna range, where it merges into the Gharian district. In this direction the plain is badly supplied with water.

To the south or east, however, the traveller on his journey will find this plain broken by various watercourses running south or south-east, and it is only on entering these that he realizes that the plateau he has left is part of the hill range.

The main outlet of this system is the Wadi Targelat, which, taking its rise at Menshi,* on the Tarhuna plateau, runs through districts called Ghirrah, Mamurah, and Tahwaleh to the sea at Kam, about 12 miles south-east of Lebda. All other wadis south of the watershed, including the broad Wadi Ueni coming from Jebel Msid, join it. There is also an intermediate group of wadis which meet in the Kseia plain, from which there appears to be outlets both north and south, the latter falling into the Ueni and Targelat, and the former to Terrgurt or by some other route to the sea-coast.

4. *Wadi Targelat and the River Cinyps.*

Within the limits of these notes, there is no room for any discussion of the ancient geography generally of this part of the coast. The principal authorities are Pliny, Mela, Herodotus, Strabo, Scylax, and Silius Italicus, and from these and other sources we know the names of certain of the Libyan tribes of this part of Africa, and also that along the coast lay the towns of Abrotonum, Oea, Graphara, Leptis Magna, and lastly a town of Cinyps, or Cinip, situated on a river and in a territory of the same name. The latter place, Herodotus tells us, was founded by Dorieus the Spartan about 520 B.C.

On my arrival in the Ghirrah district of the Wadi Targelat, my inquiries showed that this wadi ran all the way to the sea at Tabia or Kam, the latter place being the one which has been identified ever since the days of the Beecheys and Smyth with the Cinyps district. Unfortunately, I was unable to follow the wadi direct to the sea, but a later visit to its outlet set at rest all doubts as to the question.

The text of Herodotus is very clear and decisive on the subject of the Cinyps and its neighbourhood. "The Macæ adjoin them (the Garamantes) on the sea-coast westward." (He then describes methods of hair-dressing and armour.) "The river Cinyps, flowing through their country from a hill called the Graces (χαρίτων), discharges itself into the sea. The hill of the Graces is thickly covered with trees, though all the rest of Libya is bare. From the sea to this hill is a distance of 200 stadia" ('Melpomene,' 175). He also describes its intense fertility.

* Some say it rises in Gharian, in which case the Targelat at Menshi is only a tributary.

About 12 miles south-east of Leptis Magna lies, close to a bold headland marked on our charts as Ras el Tabia (but more generally known to the natives as Ras el Magro), a broad fenny plain, the black soil of which is evidently capable of great productiveness, though it still maintains the unhealthy reputation which gave name to the Cinyphian plagues; and across this winds slowly to the sea a sluggish stream, perhaps 40 paces wide, and the only river of Tripoli. This is the mouth of the Targelat, and the site that has long been identified as Cinyps.

But as all travellers are liable to error, so in this case two mistakes have been made by explorers which have ever since been perpetuated by geographers. The first affects only the modern name of the wadi, and the second (the most important) the distance from the sea at which it takes its rise. The real name of the whole wadi, as I have said, and as I proved by many inquiries, is Targelat; but every district it crosses has its own name, and the plain at the mouth is called Kam. This name Della Cella got hold of, and transferred to the wadi (Wadi Quaam), and the same error, under different spellings, was made by the Beecheys, Barth, and Smyth. In not a single work or map that I have been able to find does the real name of Targelat make its appearance.

The second error was more important, for it impeached the veracity of Herodotus, or of his copyists. Della Cella, who was here in 1817, thought that χαρίτων should be looked for in the last ranges of the Goriano chain (by which he seems to mean the lower slopes of M'salata and Tarhuna, for he calls, like most of the older travellers, all the hills Goriano), which, he says, "preserve the character . . . as being covered with trees," a description only applicable to the olive groves of these lower hills, and not to the now bare uplands about the Tarhuna plateau.

Admiral Smyth was here the same year, but did not publish anything about the Cinyps; but a few years later (1821–22) came the Beecheys, who crystallized this error into shape. These explorers, coming by coast, made inquiries as to the source of the wadi, which they knew should be 200 stadia, or about 20 miles distant. No doubt they asked where Wadi Khahan (Kam) ended, and were told about 4 or 5 miles away, that being the point where the Targelat leaves its dry course among the hills, and crosses the plain. In that direction they saw a three-peaked hill, which they concluded would answer well for the "Hill of the Graces." They noted, however, that the "Terhoona" range would answer better to the 200 stadia of Herodotus, but considered that the inferior ranges intervening would be a barrier the Cinyphus could not penetrate. Some manuscript notes of Admiral Smyth, who seems to have hit on the same three eminences, confirmed them in this opinion, and consequently the river Cinyps has been set down ever since as identical with a Wadi Kam which has no existence.

The fact that, although the Wadi Targelat does not take its rise only

4 or 5 miles from its mouth, the perennial stream does, has no doubt partly caused the error; for at that distance there are springs, and above them the wadi is dry, except in storm seasons. It was these springs which gave the plain its fertility in ancient days, though no doubt at one time the upper Targelat contained, with all the other wadis in the hills, a regular stream of water.

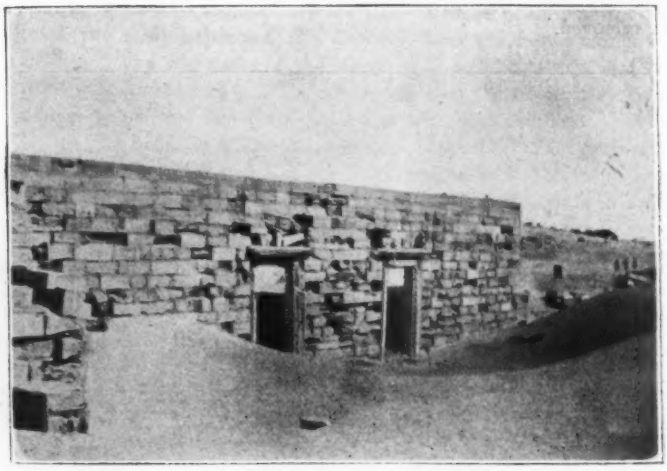
From the identification of the Targelat, two results ensue. First, either the whole of the Tarhuna range was, in the time of Herodotus, known as χαράτων to the coast colonists, or else some particular eminences within that district—in either case, a point of great interest now we know what a wonderful series of remains still exists in Tarhuna; and, secondly, the charge of inaccuracy against Herodotus or his copyists may be removed.

THE ANCIENT COTHON AT LEBDA (LEPTIS MAGNA).

With regard to the actual distance of the source of the Targelat from Kam, it is of course considerably more from Menshi and Ghirrah than 200 stadia, so that it is evident that this measurement was taken, not from the actual wadi head, but from the point it issued from the upper hills. And this would appear to be about where the range commences its slope to the sea, and at the point where the Wadi Ueni running from Jebel Msid joins the Targelat. So that this point was apparently considered by the geographers of the day the source of the Cinyps, and the hill range from which it came, further west, the "Hill of the Graces."

5. *Leptis Magna* (Lebda).

The ruins of Leptis Magna, though but little visited now, and never properly described in any work of travel, have rather an archæological than a geographical interest. Although in a sad state of ruin, much can still be seen. The cothon, or Phœnician harbour, is easily to be traced, and among the vast masses of ruin which surround it are fragments of temples, columns, custom-houses, and a great Roman circus, 470 paces in length. The country round is full of interest, for not only are there many mausolea, but the hills are capped with crumbling



FAÇADE AT LEBDA (LEPTIS MAGNA).

fortlets, probably of Roman date, and ruined megaliths of an earlier period.

By different ancient authorities Leptis Magna is termed both Tyrian and Sidonian, so that there can be little doubt as to its origin. It has been sometimes questioned why the Phœnician traders adopted the site in preference to the richer plain of Cinyps so near at hand. The colony was, as is well known, an emporium for trade with the great tribes of Phazania and Libya, but it does not appear probable that there was much difference in the accessibility to the interior from these sites. The choice was probably due to the colonists finding the mouth of the small Wadi Lebda especially suitable for the formation of their little galley cothon; and also, no doubt, to the disposition at the date of the foundation of the tribesmen whom they came into contact with in the immediate vicinity.

6. *The Tribes of Tarhuna.*

Of the tribal Arabs of Tarhuna I gave some brief account in a paper last year, and there is, perhaps, not much which need be said now. Throughout Gharian, Tarhuna, M'salata, and Jafara, the type does not appear to vary greatly, although in jealousy and fanatical feelings towards strangers they differ widely. Especially do they dislike any discussion concerning their tribal divisions and districts, and it was only after much persuasion that I obtained the following list. These are the tribes of Tarhuna, numbering thirty-six, and the list is said to be complete. It was obtained from my guide, a leading man of the Hamamleh. The list should be compared with the list of nineteen given by Barth. Those I have starred, numbering twelve, are mentioned, though sometimes differently spelled by that author. The remaining seven names, which were not included by my informant, may be of tribes which have now left the district. They are placed at the end.

(1) Aulad Ali * (this is the great tribe); (2) Aulad Um Aref (there is Senam Aref in Wadi Doga); (3) Marghana *; (4) Muzaghwa; (5) Burkat; (6) Megagerah * (in West Tarhuna, near Jebel Jumma); (7) Zeraghna; (8) Drahib *; (9) Amamreh (there is Kasr Amamre, south-east of Kusabat—Barth); (10) Meadi,* or Mehadi (there is Mehal el Meadi in Terrgurt); (11) Ferjane * (district of Ferjana); (12) Aulad Hamed *; (13) Hamamleh (sometimes at Menshi, sometimes at Ukirreh); (14) Awaseh; (15) Rhahaimieh *; (16) Shfatra *; (17) Zlas; (18) Hamadat *; (19) Amariin; (20) Bahalik; (21) Ariash; (22) Sualeh; (23) Sulala; (24) Ghanaimieh; (25) Ferjane el Ghararеh; (26) Duaiim; (27) Aulad Tarhune; (28) Arabiin; (29) Gheraghta *; (30) Talah; (31) Hajaj; (32) M'saaba (in Doga); (33) Khamudat; (34) Atershan (in Guman); (35) Gherarat; (36) Naajeh.* [Welad Bu Sid, Welad bu M'areh, Welad Yusat, Welad Ba Sellem, Mata, Khwarish, Bu Saba.]

It may be noticed that the name of the Sumait Arabs, mentioned by Leo Africanus as inhabiting the Tripolitan wastes, does not occur here. In the neighbourhood of Misrata, which is of course outside Tarhuna, there is a tribe who eat dogs, a custom always alluded to by the Tarhunis with disgust or derision.

7. *The Halfa Grass Industry.*

Of late years the demand for esparto, or halfa, has given a new occupation to the hillmen. The grass grows wild in many parts of the hills, both in Western Tarhuna and further west in the district of Jebel. The grass is gathered by hand, the harvester winding each handful round a piece of rough stick and jerking it away. Some say that this rough method is gradually extinguishing the crop; but it does not really appear that this is the case, for, if properly pulled, the grass is only drawn from the sheath, not torn by the roots. The trade was

begun at Tripoli in 1868, and at Khoms in 1873, and although there are funduks, or yards, at Tabia and Zliten, most of the grass is brought to the first-named places. The grass is conveyed on camels, one animal's net averaging about 4 cantars of 40 okes each. The price now realized at Khoms or Tripoli is 9 to 11 piastres a cantar; *i.e.* 36 to 44 piastres a camel-load, or about 8*s.*; whereas when the trade was young, the price realized to the Arabs was 25 piastres the cantar, which equals 100 piastres, or about a pound the load. This great fall is said to be due to the competition, there being about three firms engaged in the trade, one of which is English, and the others Jewish or native. The latter cut down profits to a minimum.

The tribesman who brings down a load of grass 20, 40, or even more miles to the coast, receives for it then about 8*s.* But prior to the sale the following charges must be paid: 1¼ piastre per cantar to Government; 20 paras per net weighing duty; 10 paras funduk or warehouse charges.

He may, however, clear his 42 piastres, and this is what becomes of it: One-third goes to the owner of the land; one-third to the harvester; one-third to the camel-man for transport.

In other words, they each make about half a crown, of which the landowner has the best profit, for he has had no labour in tillage or transport or planting. But it is difficult to see how the camel-man and harvester can find it pay.

There are, of course, different qualities of halfa. The best is called "el arus" (the bride); the second, "secondo." The inferior qualities do not appear to have special names.

8. *The Position of the pre-Arab Town of Tripoli before the Mohammedan Occupation.*

If we look at the Admiralty chart of Tripoli, we get a good idea of its present position upon a promontory; but we have the evidence of Leo Africanus that traditionally it stood further north. This, however, has been disputed to some degree by modern writers, on the ground that outside the reef of rocks to the north we get into deep water.* The tradition, however, did not, I imagine, mean that the distance further north was great, and it may well be that these rocks were at one time joined to the mainland and built upon. There is also some evidence that the town extended further west along the shore; and, indeed, if it were not so, ancient Oea must have been a very small place.

* See Captain F. W. Beechey and H. W. Beechey; also Rae, 'The Country of the Moors.' And in this year, 1896, the question is commented on by Dr. Robert Brown in the new Hakluyt Society edition of Leo Africanus. All interested in Tripoli should study Leo's account of the city.

The following account of its capture by the Arabs seems not to have been noticed much, if at all, by modern students and travellers; but it is very important, as it shows that the hill on which the castle now stands was at that date clear of the town walls to the south.

The Arab historians, Ibn Abd el Hakim and El Leith ibn Said, narrate that the Arab general, Amr ibn Ali el Asi, camped on the summit of a hill to the east of Tripoli, and besieged it A.H. 23. From what followed, it is evident that this hill was the rock on which the Kasr now stands, and at that date it was outside the city. We are told that, after a month's fruitless siege, a hunting-party of eight left the camp and went west. "Returning home, it being very hot, they followed the sea-beach. In those days the sea came up to the extremity of the city walls, and between the sea and the city there were no walls, so that the Greek ships entered the port so far as to moor near the houses. The Arabs perceived that the sea, in ebbing near the anchorage, had left a space by which an entrance into the city could be effected. They entered the city to the cry of 'Allahu Akbar.' The Greeks had no other refuge but their ships, and Amr, who saw naked swords gleaming in the town, advanced (from the hill) and entered. The Greeks could only fly in their lightest ships, and Amr put the city to the sack."

This interesting account is probably in the main correct, but we may surmise that the hunting-party was in reality an organized surprise. Amr was on the summit of the castle rock, the only hill of any sort on the south-east, and thence he would, so to speak, look right into that part of the city now called Homet Bab el Bahr, which is also high. Amr's post was evidently clear of the city walls, which must have commenced from the sea, somewhere between the castle and the modern custom-house, and passed west through the centre of the present town, and joined the sea some little distance further west.*

The harbour, however, which could never have been a good one, must have been formed of the anchorage under the lee of Mendrik headland; but there may have been another anchorage west of the modern Tripoli, near where a Jewish cemetery now is. In bad weather Greek sponge-boats shelter here now. But betwixt this point and the Mendrik fort (the north side of the promontory) it seems doubtful if good anchorage for sailing-vessels could ever have been got.

9. *The Kaimakamliks and Mudiriehs of the Hill Range.*

The following short list gives the above. At all the places mentioned there is a little garrison, and consequently a few built houses. All the native population live in tents or underground dwellings.

* Ancient foundations, culverts, passages, and substructures are numerous to the west of the town, in a piece of sandy cliff near the shore. They had probably something to do with the water-supply of ancient Oea.

		Residence.
M'salata	Kaimakam	M'salata
Tarhuna	Ditto	Kasr Tarhuna
Orfilla	Ditto	Orfilla
Misrata	Ditto	Misrata
Zliten	Mudir	
Tuargha	Mudir	
Sirt	Mudir	
Gharian	Kaimakam	Kasr Gharian
Jebel	Mutasarif	Yefrin
Nallut	Kaimakam	Kasr Nallut
Kikela	Kaimakam	
El Hout (pronounced like "goat")	Mudir	

Altogether there are thirteen kaimakams and eight mudirs in Tripoli. The former get from 1500 to 2500 piastres a month; for the latter, 1200 piastres is the highest pay. Mutasarifs rank next to walis.

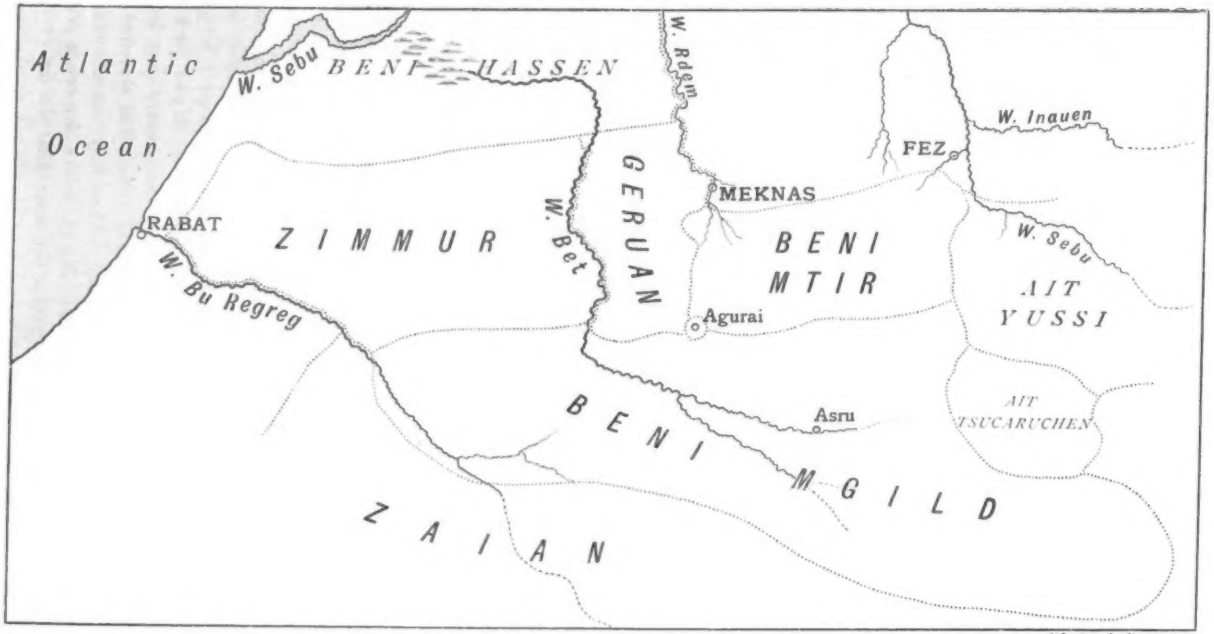
THE NOMADIC BERBERS OF CENTRAL MOROCCO.

By WALTER B. HARRIS.

In describing a journey to Tafilet and the oases of the North-West Sahara, the writer stated that never on his travels in Morocco had he come across any division of tribe of the Hamitic Shloh or Amazigh race who apply to themselves the name of Berbers. His recent journey, however, to a district lying south of a line drawn from Fez through Meknas (Mequinez) to Rabat on the Atlantic coast, has brought him in contact with a section of this people who do employ this term, of which the singular is "Berberi," and the plural "Beráber." This group of tribes inhabit a region that may be roughly described as Central Morocco, although on the west it extends almost as far as the Atlantic seaboard. Their northern boundary is the line above mentioned (Fez, Meknas, Rabat), though to the west of Meknas they extend slightly to the north. Their eastern frontier is a natural one, consisting of the northern end of the main chain of the Atlas mountains, while to the south the upper waters of the Um-er-Rbía, above Tedla, and more to the westward the plain to the north of the course of that river, form their limits. Five large and important tribes inhabit this region. Two others (Aït Tsugarúchen and Aït Yussi) are by the natives themselves included in the group, but as this paper deals especially with the *nomadic* tribes, and the author did not penetrate as far east as their country, but little mention need be made of them. The five tribes to be considered are, then, Zimmur, Geruan, Zaian, Beni Mtir, and Beni Mgild. Owing to their nomadic habits, it is impossible to

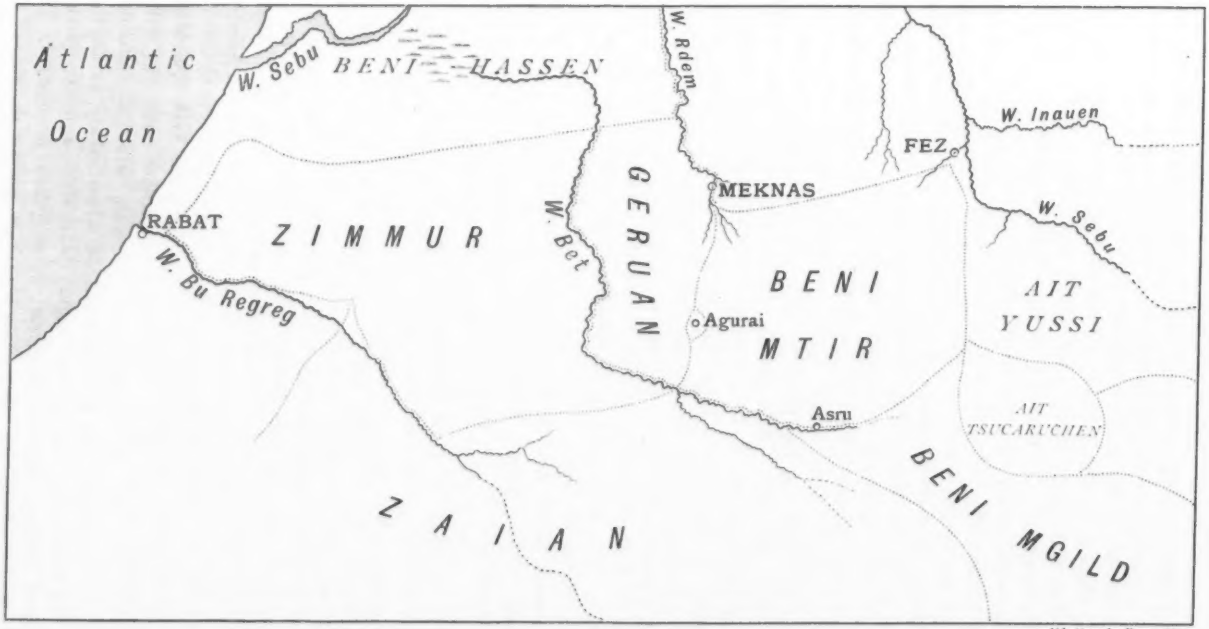
place them upon one map, for country which is filled with the Beni Mgild in winter becomes in summer the resort of all the other tribes, as will be described anon.

How nearly these Beraber are related to the Shloh people, the sedentary Berbers of the Atlas and trans-Atlas districts, it is difficult to say, but this much is certain—that, while of one common origin, they differ to a great extent in habits and language, though in a tongue like Shelha, which is very seldom written, and only in Arabic characters, there are always to be found many dialects. Yet the nomad Berbers can scarcely comprehend the tongue of their co-Hamitic neighbours, the *sedentary* tribes, though the language of the five tribes enumerated is distinctly one, although split up into dialects differing slightly one from the other. What, however, forms a more important break between the Shloh and the Berbers is the fact that, while the former, with the exception of the shepherds of some few Sahara tribes, are sedentary, the latter are entirely dwellers in tents, and for the most part nomadic. The Beni Mgild have, it is true, built some villages on the higher peaks of the Atlas, but these are only inhabited in summer, and entirely deserted as soon as the snows commence, when the inhabitants seek the lower and more clement districts with their tents. It will thus be seen that this large tract of country—over 100 miles in length, and averaging some 50 in breadth—is almost devoid of any buildings, such as there are being entirely "ksor," or fortresses, erected at various times by the Moorish sultans in their attempts to enforce their authority upon the people. How far successful they have been in this will be realized when it is pointed out that to-day, as always, the sultan, in order to travel from Fez, his northern capital, to Marakesh, the southern, is obliged to proceed *viâ* Rabat on the Atlantic coast—a course that lengthens his journey by probably 120 miles or more, no small distance in a country where roads and bridges do not exist, and where his Majesty's retinue number many thousands of persons. A glance at the two sketch-maps appended will show the respective positions of the tribes in winter and summer. The Beni Mgild, who in summer inhabit the highlands of the Atlas, descend in the late summer and autumn; and at the same time the four tribes of Zimmur, Geruan, Beni Mtir, and Zaian contract, leaving the lands they have held since the spring to the new arrivals. Unwritten laws exist as to the movements of these tribes. As soon as the ploughing is over, generally about the beginning of March, the Beni Mgild pack up their tents and migrate to the mountains; and the country they leave is almost immediately filled by members of the tribes that surround it, each having its specified share of territory. Three days are allowed to elapse after the departure of the Beni Mgild, before the other tribes enter the country. It will be seen from the maps that the two tribes of Zimmur and Geruan make but a very slight movement to the south,



Walker & Boutall sc.

SKETCH-MAP (NO. I.) SHOWING THE RELATIVE POSITIONS OF THE FIVE NOMADIC TRIBES (IN LARGE SLOPING TYPE) OF BERABER, *BEFORE* THE ANNUAL SPRING MIGRATIONS.



Walker & Boutall sc.

SKETCH-MAP (NO. II.) SHOWING THE RELATIVE POSITIONS OF THE FIVE NOMADIC TRIBES (IN LARGE SLOPING TYPE) OF BERABER, *AFTER* THE ANNUAL SPRING MIGRATIONS.

the Beni Mtir and Zaian sharing most of the region, in which they become in spring and summer neighbours, to be separated again in the autumn and winter by the Beni Mgild.

The district described above as Central Morocco consists, to the north, of a wide plain rising from a line drawn from Fez to Meknas (1500 feet altitude), to a range of foothills lying at an average of some 16 miles to the south. The altitude of Agurai, on the plain and immediately to the north and at the foot of this range, is 2200 feet above the sea-level, so that the plain rises some 700 feet in a distance of 18 miles (the distance between Meknas and Agurai). This line of hills, running parallel to the Fez-Meknas road, forms the northern side of the valley of the Wad Bet, a tributary of the Sebu, which river it joins in the tribe lands of Beni Hassen. East of the Bet is a second and higher range, known as Jibel Gadáruz, which appears to be an offshoot of the main chain of the Atlas, and, like the hills further north, has a general easterly and westerly direction. Whether the continuation of this range to the west of the Wad Bet is termed Gadáruz, the writer was unable to ascertain. A third line of hills, parallel to the other two, lies to the south of Gadáruz, but of considerably less elevation. The writer never ascended, even in the higher portions of Gadáruz, over 4300 feet above the sea-level, though the mountains round rose considerably above that elevation. The natives being all nomadic, there are but few spots that bear any distinctive name. The more productive springs and the "ksor," or fortresses, before mentioned, are the sole names that the writer heard. Of these "ksor," Agurai, some 18 miles due south of Meknas, is the most important. It is a small town, surrounded with walls of from 40 to 50 feet in height, and built of "tabía," or consolidated rubble. It owes its existence to Mulai Ismail, who held the throne of Morocco from 1722–1757. One gate alone gives entrance to the place, and in this respect, as well as in its architecture within and without, it much resembles the "ksor" of the Sahara described in the writer's 'Tafilet.' But it owns one feature of curiosity which was lacking in the desert, for almost without exception the entire population are descendants of the renegades and Christian slaves of the time of Mulai Ismail, with the addition of stray renegades who have been sent there since. Probably no such cosmopolitan place exists in the world, for its three or four hundred inhabitants are representatives of no less than thirteen nationalities. Each family remembers and is proud of its origin, the Arab equivalents being applied as surnames. The family in whose home the writer spent the few days of his visit were Flemish, while the next-door neighbour on one side was an elderly female, whose father, an Englishman, had become a renegade some eighty years since, and who quickly tired of it, leaving a wife and daughter, the neighbour in question. The other neighbours were the descendants of Spanish gipsies, the head of the family being "Absalam ben Mohammed el Gitano el Espanoli." They

were particularly proud of the "Gitano" (gipsy) part of the surname, and begged me not to confound them with the ordinary Spaniards, of whom there were many descendants in Agurai. The ancestor of this gipsy family was two generations back. He had left his country, they naïvely told the writer, because he was not on good terms with his sultan, who wanted to imprison him, being afraid of his influence. Probably it was more of an affair of the police courts than political intrigue. The "Ulad el Aluj" ("sons of the converts"), as the inhabitants of Agurai are called, have entirely, except in one or two cases, lost the type of their European ancestry, and through marriage, no doubt, are as largely Berber in appearance as the wild tribes that surround them. They speak amongst themselves both Arabic and Berber, and both, curiously enough, with a strong foreign accent, easily distinguishable. They are exempt from all taxation, but have to serve in the sultan's army, where they perform the duties of cooks and butchers. A certain quantity of land surrounding the "ksor" is theirs to plough, but their position on the very frontier of four Berber tribes is by no means an enviable one, and the little place and its adjacent market are constantly the scenes of bloodshed. Some 25 miles south-east of Agurai is Asru, another fortified "ksor," and the residence of a "kaid," or governor, of the Beni Mgild. The authority he possesses over his turbulent tribe, however, can be gauged when it is stated that he can never leave his castle without a large body-guard, and even requires a company of infantry, lent him by the sultan, to defend the walls from attack. The province of Zaian possesses several of these "ksor," for the most part along the upper reaches of the river Um er Rbía, above Tedla. The northern waters of this river appear in the maps as too far to the south, and apparently, instead of rising in Jibel Ayashin, its source is considerably north of that mountain, nearer the north-eastern extremity of the Beni Mgild territory.

Every traveller who has visited Fez and Meknas must have been struck by the planks and beams of the wood of the *Cedrus Atlantica*, which meet the eye on every side, and the handsome colouring of the native "arrar" wood (*Callitris quadrivalvis*). Of these two woods the entire timber-supply of Fez and Meknas consist, while large quantities also reach Marakesh and Rabat. In fact, the mountains of this district are almost the sole remaining forest land in Morocco, and here only, with the exception of the walnuts of the Southern Atlas, are really large trees found. On the northern range of hills, some 16 miles south of the Fez-Meknas road, the forests commence, but the cedar is only rarely found, the "arrar" being almost the only tree of any size, while the arbutus and laurustinus, lentiscus and palmeto form a dense scrub. As one proceeds to the south the cedar becomes more common, and almost the entire range of Gadáruz is thickly overgrown with specimens of magnificent size, the trunks of which, 4 feet from the ground, three

and four men cannot span. Fortunately, the primitive axes and adzes of the Berbers are useless against these giants, and so they escape, the medium-sized tree falling a victim to the woodcutter in their place. Of saws they have none, and the waste occasioned when every plank is hewn out of the trunk can be imagined. A large cedar, which would give at least eight or ten planks when sawn, produces at the most five when hewn. Yet the supply seems inexhaustible, owing to the difficulty of transport from any but the more accessible portions of the country, and the district is likely to remain, as it is to-day, one of the most beautiful forest scenes imaginable.

The Berber villages are all pitched in circles, the tents being of goats' hair dyed a very dark shade of purple, almost black, with the rinds and husks of the pomegranate. Into the circle are driven the flocks and herds of cattle at night-time, and the entrance, a space left between two tents, is closed by a hurdle of thorns. In this manner there is some immunity from the theft and raiding so common to the country.

The principal occupation of the Berber tribes is the tending of flocks and herds, there being, owing to the nature of the soil, but little cultivation. On the plain to the south of Meknas and Fez, a rich dark loamy soil appears here and there in depressions in the red sand, and is ploughed during the winter; while some of the valleys of Gadáruz, more especially the banks of the Wad Bet, produce good crops of wheat and barley. But the Berber is essentially a shepherd, and it is for the grazing of his flocks and herds that he spends the summer in wandering from spot to spot in the forest. The Beni Mtir, who spend the winter in the northern plain, retire to the forest as soon as the Beni Mgild have left it, and do not return until it is time to reap the grain which they have sown in winter. This same movement, only north instead of south, takes place in the tribe of Zaian.

Some mention must be made of the tribe of Beni Hassen, which, originally of pure Berber stock, has become to-day almost an Arab tribe, the Shelha language having entirely disappeared. The tribe inhabit tents, and in many parts thatch huts as well, and are looked upon with scorn by the more conservative Berbers, and are often even described by them as Arabs. They preserve, however, their warlike nature, and are celebrated thieves. They do not migrate, except, in places, to change to some adjacent spot their camping-ground, with the object of escaping the vermin in summer and the mud in winter, both of which collect around the tents from the number of animals which pass the night inside the circular villages. They are constantly at war with the Zimmur, and several pitched battles, to say nothing of cattle-raids, took place in 1896. In one of these over eighty lives are said to have been lost—no small number in a native fight. The Beni Hassen, like all other Berber tribes, are one and all good horsemen, and almost

every man possesses a horse. They will deny themselves almost the necessary food and clothing in order to possess a steed and a rifle.

Although the tribes enumerated above came of one common stock, and are closely allied, forming a distinct branch of the Berber race in Morocco, it must by no means be thought that they live at peace amongst themselves. Every tribe, and often the subdivisions of tribes, is at war with its neighbour, and at the "sok," or market, outside Agurai, which all patronize, so common has become bloodshed and murder, that to-day only the members of one tribe market at a time. As soon as they have completed their purchases or their sales, they mount their horses and ride away, leaving the scene free to another batch, who have probably been waiting their departure and watching them from some hilltop near by. The writer's presence at Agurai caused no little commotion amongst the people, for apparently no other traveller, at least in the memory of man, had preceded him; and the members of the tribe of Beni Mgild, who were in the market at the time, one and all anxious to question the "Rumi," as they call a European, refused to go, until the Zimmuris, seated on a hilltop, sent a message to the writer, asking him to disappear for a time, so that the Beni Mgild might depart, and thus give them a chance of marketing.

As a rule the Berbers of these districts are trustworthy, the system of safe-conduct—"zittat," or "mzareg"—being in force; but the many intertribal quarrels of the Beni Mgild render travelling, even to a native, very dangerous, and to a European, unless he can play the native satisfactorily, impossible. The writer travelled as a European in native dress, but in dangerous districts the members of the tribe by whom he was accompanied as "guarantees" took good care not to inform the general public of his nationality, though in a short space of time the rumour of his presence became general. He found the principal difficulty of getting about to consist in finding men whose influence was sufficient to take him through without risk of hostile demonstration or attack, though he saw nothing of either. In fact, in the parts where he was able to go at all, he was excellently received, and much kindness and hospitality were shown him.

THE GERMAN GEOGRAPHICAL CONGRESS AT JENA.

By HUGH ROBERT MILL, D.Sc.

The geographers of Germany hold a Congress every second year in Easter week to discuss the progress of their science, and in particular the methods of geographical education. The meeting at Bremen in 1895 was briefly reported in the *Geographical Journal* for June in that year, and it was then decided that the twelfth *Deutscher Geographentag* should be held at Jena in 1897. While recognizing the distinctly

national character of this great German gathering, the Council of the Royal Geographical Society deputed me to attend as a representative of the Society—an expression of respect for the high development of geographical science in Germany. The importance of the meeting, and the hope of strengthening the interest in geography in the schools, if not in the universities, of this country, induce me to present to the Society a somewhat full report of the proceedings. One other foreign society, the Hungarian Geographical Society, was officially represented, and altogether, out of a total attendance of nearly six hundred, there were about twenty-five foreigners—many of these being American and Scottish students attending German universities.

In spite of the large number who assembled, many of the best-known geographers of Germany were absent; Professors Richthofen, Rein, Regel, Ratzel, Credner, von den Steinen, Count Pfeil, and several others, did not appear, several of them being abroad. The absence of Prof. Haeckel also made a notable blank. Prof. Neumayer of Hamburg, the President of the Congress, made up by his genial presence for many absentees, and the higher walks of German educational geography and allied sciences were well represented by Professors Futterer of Karlsruhe, Gerland of Strasburg, Hahn of Königsberg, Hettner of Leipzig, Kirchhoff of Halle, Kükenthal of Jena (the indefatigable president of the local committee), Naumann of Munich, Neumann of Freiburg, Oberhummer of Munich, Partsch of Breslau, Semon of Jena, Supan of Gotha, Wagner of Göttingen, Wahnschaffe of Berlin, and Walther of Jena. To these may be added Graf von Linden, Graf E. von Zeppelin, Graf M. von Zeppelin, Colonel Frobenius, Captain Kollm (the secretary of the Berlin Geographical Society and of the Geographentag), Dr. Lindeman, Herr Koldewey, and Consul Schönlank. Other names well known in current geographical work were represented by Doctors Baschin (the compiler of the Berlin Geographical Society's splendid annual bibliographies), Bludau, Halbfass, Hassert, Keilhack, Kretschmer, Oppel, Hans Meyer, Hermann Meyer, Phillipson, Römer (the local secretary of the meeting), Schenck, Schott, Ule, Wegener, and Zimmermann.

No other country can produce such an assemblage of scientifically trained students, teachers, and professors of geography, representing every department of exploration, research, and instruction. The neglect of geography by British universities is thrown into high relief by the consideration of such a list of names, and the ultimate fate of geography in this country, if such a state of matters is allowed to continue side by side with the progress in Germany, is cheerless indeed for Fellows of our Society to contemplate. The facts as to German work, and the richness of its results, are of course perfectly familiar from books, reports, and journals, but the unity, strength, and enthusiasm of the German geographers require to be seen to be fully realized. I do not for a moment suggest that German

methods should be transplanted, or even copied, in this country; but, having seen something of these methods and their results in their own fatherland, I feel it a duty to give expression to the urgent importance of wider recognition and encouragement of scientific geography in this country, so as to allow of the growth and ultimate prosperity of a distinctively British school. The greatness of our achievements in exploration in the nineteenth century must not be allowed to obscure the present slender prospect of pre-eminence for British geography in the twentieth.

Jena occupies a somewhat remarkable geographical position, standing on the flat valley of the Saale, where it trenches the Thuringian plateau, and surrounded by the picturesque hills into which the tributary streams have cut up the edges of the tableland. It is claimed, not without reason, as the heart of Germany, for it occupies the intersection of the two diagonals drawn from the north-eastern to the south-western, and from the north-western to the south-eastern, corners of the German empire. The limits of the ancient walled and moated town are traceable by the four streets still called *Graben*, which occupy the site of the old rectangular moat, within which the picturesque market-place and quaint narrow streets of the old town are crowded, while beyond them the modern town spreads in broad streets with spacious gardens across the river on one side, and over the lower slopes of the plateau edge on the other. The University has made Jena famous for the last three centuries, and the memorial tablets placed on the front of half the houses in the town—so it seems to a stranger—point out the temporary dwelling-places of famous visitors and residents, from Dr. Martin Luther in 1522 to Prince Bismarck in 1892. A certain industrial importance is given to Jena by the great glass works of Messrs. Schott and the world-renowned optical factory of Zeiss.

On the arrival of the geographers on Tuesday, April 20, they found the whole town expectant as for a visit of royalty. Triumphal arches, with an inscription of "Welcome," spanned the road opposite the two railway stations; scarcely a house was without its flags—the black, white, and red of the empire, or the black, green, and yellow of the grand duchy of Saxe-Weimar—and the market-place was beautified with Venetian masts festooned with evergreens, while freshly cut pine trees were placed on each side of the doors of the hotels. A reception committee met each train, and saw the visitors into the omnibuses for the hotels in which rooms had been allotted in advance. The office of the Congress in the Burgkellar was kept open until 11 p.m. for the supply of tickets, and each member and associate received with his ticket of admission a memorial volume, descriptive in verse and picture of the beauties of Jena, a packet of the postcards with local views, without which no German holiday is complete, and a free ticket for a special theatrical performance in Weimar.

Five sittings of the Congress were held for the reading and discussion of papers, the chair being taken at 9 a.m. and 3 p.m. each day, except on Thursday, when there was only the forenoon sitting.

The first meeting, at 9 o'clock, on Wednesday, April 21, filled the quaint old "Rosensäle," a large hall belonging to the University, and forming part of the curious old inn, the Rose, the headquarters of one of the students' corps. The officials of the Geographentag appeared in evening dress, with orders, and the proceedings were opened with great ceremony. Prof. Neumayer called upon Prof. Kükenthal, as president of the local committee, to take the chair, and the latter delivered a short address, welcoming the geographers to their twelfth German Congress. Herr von Pawel, the Chief of the Grand-ducal Department of Public Worship, welcomed the assembly on behalf of the reigning Grand Duke of Saxe-Weimar, and, in the course of his remarks on the benefits conferred by Geography on the state, observed, "Thank God that we have attained to this, that Germany is no longer a mere geographical expression, but a powerful and respected empire which has secured the spread of German science, German research, and German enterprise far beyond its own borders." The Grand Duke was also represented by his grandson, Prince Bernhard Heinrich of Saxe-Weimar; and his cousin, Prince Herrmann of Saxe-Weimar, was present at several of the meetings. Prof. Löning, as representative of the University, welcomed the members, and expressed the full sympathy which the University felt with geographical researches, and the high appreciation in which geography was held as a central science enriching and deriving benefit from all other sciences. The last official welcome was delivered with the greatest heartiness by the Chief Burgomaster of Jena, who expressed his conviction that, in spite of the dulness of the morning, the heavens would smile upon the Congress—a weather prediction which was fortunately fully verified. Prof. Neumayer then touched briefly on the programme of the meeting, announced the chairman, vice-chairman, and secretaries chosen for the day, and declared the Congress open for work.

Prof. Neumayer presented the Report of the German Committee on Antarctic Exploration, which was appointed at Bremen in 1895, and has held several meetings, the last having taken place on the previous day at Jena. Recognizing that it is useless to expect Government aid, the committee resolved to appeal to the German nation for funds to carry out a great antarctic expedition, to consist of two ships equipped for three years. Prof. Neumayer expressed his gratitude for the amount of interest taken in the project by the daily and periodical press of Germany, and disclaimed any connection with another scheme which had been mooted for landing a small party of Germans to spend a winter at Cape Adare. He referred to the Belgian Antarctic Expedition now nearly ready to start, and also spoke of the prospect of a British

expedition under the auspices of the Royal Geographical Society. Such an expedition he felt sure would give a good account of itself, but he appealed to German patriotism not to neglect the present opportunity of leading the way in exploring so vast a region of the unknown. With regard to the German expedition, a definite plan was adopted in December, 1895, and still holds good. It contemplates observations in all departments of science, as well as geographical exploration. The region selected for making an attempt to reach a high southern latitude is that to the south of Kerguelen. The position of the observatories at Cape Town, Melbourne, and in Mauritius would enable meteorological and magnetic observations south of the Indian Ocean to be more completely utilized than if they were made at any other part of the unknown area. It is proposed to equip two vessels of about 400 tons, each with four officers, four scientific men, and a crew of twenty-two. The leader of the expedition is to be a sailor of thorough practical and scientific attainments, and the whole estimated cost is £47,500. At a later meeting the following formal decision of the committee was announced:—

"In order to bring the question to a definite point, a suitable leader of the proposed expedition shall first be found, and this will probably be done within the next few months. After the selection of a leader, the small executive committee, which has already been appointed, wil immediately take suitable steps to raise the necessary funds."

The remainder of the morning sitting was occupied by a paper by Dr. Hermann Meyer (brother of Dr. Hans Meyer) on his recent journey in Central Brazil, and one by Dr. H. Zimmerer on German Exploration in Asia-Minor. The latter drew a vivid picture of the importance of German commercial interests in Asia-Minor, and dwelt upon the cordiality with which Germans are received by the Turks. The German name opened all doors, he said, and smoothed all roads from Jaffa to Constantinople; in Asia-Minor Germany is now *la grande nation*, to which the Turks look for the elevation of their country.

At the commencement of the second sitting, the chairman announced that the Prussian government had declined to accept the suggestions of the Geographentag that the contour-lines on the official map should be printed in colours, and that special evidence of proficiency in geography should be exacted of teachers of the subject in the higher schools; but that the governments of Prussia, Oldenburg, and Hamburg had agreed to the request that they should institute exact determinations of the changes of certain parts of the North Sea coast. The sitting was then devoted to questions of educational geography. Dr. Fischer, of Berlin, speaking of the position of geographical teaching in Prussian schools, expressed himself very strongly against the new regulations, which he characterized as a method for the wider deterioration of geographical teaching. Their result is that teachers without a specially attested knowledge of the subject are permitted to teach geography, and only

about half of the geography-teachers in the Berlin schools have qualified themselves as specialists in educational geography. This, of course, does not mean that they are without a competent general knowledge of the subject, probably better in all cases than that possessed by even the more intelligent English teachers.

Prof. Sievers, of Giessen, described his method of long geographical trips with advanced students, such as he had carried out in different parts of Germany. Each trip lasted about a fortnight, and not more than ten students were allowed to take part in it. Care must be taken to prepare those selected beforehand for what they were going to see, and to discuss what they have seen during the excursion fully afterwards. By such practical lessons alone could the full educational value of geography be utilized. The main obstacle to carrying out this system in schools is the expense, estimated at £5 per head for each trip, and Prof. Sievers suggested that the cost of this valuable adjunct to education should be paid by the State.

Prof. Palacky, of Prague, concluded the sitting by a paper on the method of establishing school herbaria.

The third sitting, which took place on the morning of Thursday, April 22, was devoted to geophysical questions. Prof. Gerland, of Strasburg, gave an account of the present position of Seismology, and urged the importance of establishing an international system of seismic observations by means of the horizontal pendulum. Prof. Supan, of Gotha, followed with a scheme for systematic earthquake observations. He pointed out that at present it was impossible to draw an earthquake-map of Germany. He held that, on the basis of practical utility, it was the duty of the State to establish seismological observations in the same manner as meteorological. This had been done in a very satisfactory way in Japan. A lively discussion followed the reading of these papers, in the course of which some difference of opinion as to the best means of establishing seismological observations appeared.

Subsequently the following resolution on the subject was adopted:—

"The Twelfth German Geographical Congress considers that the establishment of systematic seismological observations in all countries should no longer be postponed, and expresses the hope that the German Government will forthwith take the necessary steps in this direction. The method adopted in Japan may be recommended as worthy of imitation."

Dr. A. Schmidt, of Gotha, then read a paper on the geographical problems of terrestrial magnetism. He considered the question of the superficial distribution of magnetic conditions in regard to the hints it affords as to the internal structure of the Earth, and pointed out the importance of combining theoretical research in magnetism with practical observations of terrestrial magnetic conditions, in order to obtain the data essential to the solution of the problem. Dr. Naumann,

of Munich, dealt with the relation between geotectonic and magnetic conditions, illustrating his statements with references to his work on the geological and magnetic survey of Japan.

In the afternoon Professor Walther, of Jena, gave a demonstration in the geological museum, which occupies part of the castle in the north-east angle of the old town. He showed an ingenious arrangement to illustrate the wrinkling of the crust of the Earth by the reduction of its volume. A thin indiarubber balloon was inflated with air to about 8 inches in diameter, and provided with a pinch-cock, by which the air could be let out gradually when desired. The balloon was covered with a stiff paste of flour, dry flour dusted over the surface, and the air was then allowed to escape. As the balloon shrunk in volume, the smooth surface of the paste was thrown into irregular ridges and hollows, some of which strikingly resembled the orographical features of the globe. He also exhibited a model illustrating the geological strata, faulting, and erosion of the Thuringian region, by the adjustment of which it was possible to repeat in a general way the more important of the surface changes which the country has undergone. A relief-map of the district coloured geologically was also explained.

Later in the afternoon, the members of the *Geographentag* visited the Carl Zeiss Optical Factory by special invitation, and saw the whole process of the manufacture of lenses and prisms, the brasswork, and the final fitting up of microscopes, spectroscopes, photographic cameras, and, in particular, the new field glasses adapted for direct vision or for seeing round corners or over walls without exposing the observer.

On Friday morning, the 23rd, the fourth sitting, devoted to biogeography, took place. Prof. Semon, of Jena, dealt with the geographical problems the solution of which was facilitated by biological studies, with particular reference to his own recent work in Australia. The absence of the higher mammalian forms from Australasia proves that it was separated from the rest of the world in early Tertiary times, when also New Guinea was separated from Australia, the Bismarck archipelago being subsequently isolated from New Guinea. Tasmania must have been connected with Australia until Pleistocene times, and its inhabitants may have entered it by land. The contrast between the fauna of the east and west of Australia makes it probable that these were separated until the Pliocene period by deserts in the north, and marshes or the sea in the south.

Dr. Hahn, of Lübeck, read an entertaining description of the distribution of beasts of burden. He distinguished two classes—those which, like the reindeer, yak, camel, llama, and elephant, are restricted to certain definite regions; and those which may range over the whole world, such as the dog, horse, donkey, and ox.

Dr. Schneider, of Dresden, discussed a piece of detailed investigation which he had carried out on the fauna of the island of Borkum.

Dr. Roman Oberhummaer, of Munich, presented the report of the Central Committee for the scientific geographical description of Germany, with which the name of Prof. Kirchhoff has been so long associated.

The fifth and final sitting took place on Friday afternoon. It was announced that the Thirteenth German Geographical Congress should meet in Breslau, and, in the event of the Seventh International Congress meeting at Berlin in 1899, the Committee had power to alter the date of the Breslau meeting to 1900.

Prof. Walther, of Jena, read a paper on the geographical features of Thuringia in relation to its geology, in the course of which he gave a brilliant description of the scenery of Central Germany. It was received with enthusiasm, and was certainly the most popular and by no means the least scientific of the communications to the Congress.

Dr. Karl Peucker, of Vienna, read a long paper on the shadows cast by mountains at different seasons, illustrated by numerous diagrams. The meeting concluded with a series of votes of thanks to the various individuals and bodies which had co-operated to make it a success.

The attendance at every sitting was large, and the attention of the audience remarkable. Of the 583 people who took part in the proceedings, no less than 358 were resident in Jena—a very significant fact bearing on the widespread interest taken in geography in the small towns of Germany. It is to be feared that the result of a similar meeting in a British University town during vacation would be somewhat different.

A word of special praise must be given to the reports of the meetings and the excellent abstracts of the communications published by the local daily paper—the *Jenaische Zeitung*. The efforts of the local committee ensured the smooth working of all the arrangements. While there is so much to praise, I may perhaps be allowed to note that the set of meteorological instruments exposed to public view, and presumably for public instruction, in a "Wetterhäuschen" on the Fürstengrabe is not a credit to the University before whose buildings it stands, nor to the town which is famous all over the world for scientific instruments of the highest precision.

The social part of the meeting was of the pleasantest kind. On the evening of Tuesday the 20th an informal welcome was given in the Burgkellar, where beer, tobacco, and the liveliest conversation were the order of the evening. On Wednesday night over two hundred of the members, including ladies, had a dinner in the Theatre hall, which was very tastefully decorated. The toasts were proposed between the courses, and, beginning at 7 p.m., it was long past midnight before the meal was brought to a close by the appearance of Usambara coffee, and cigars from the Cameroons. Two original geographical songs, composed by Prof. Leo Sachse, were sung with great gusto. Thursday's entertainment took the form of a social evening in the

Schwarzen Bär, the inn patronized by Luther in the sixteenth century and Bismarck in the nineteenth; and on Friday the last and best was a "Festkommers" given by the town in the Turnhalle. This was under the presidency of the genial Oberburgermeister Singer, and was the occasion for many capital speeches, and a number of patriotic and geographical songs accompanied by a powerful band, and swelled by the voices of a large number of students, who were returning to the University for the summer term.

A special free excursion was conducted to Weimar on Saturday, and a performance of "Tannhäuser" given in the theatre so closely associated with the memory of Goethe and Schiller. There were frequent opportunities at Jena for short excursions to the surrounding heights, from which fine views of the district were obtained.

GEOGRAPHY AT THE UNIVERSITIES.

The following report on geography at Oxford during the past year has been received by the Council from Mr. H. J. Mackinder:—

"I have delivered three courses of lectures at Oxford during the past academic year, upon Central Europe, upon Britain, and upon the Far East. The attendances have been as follows: in Michaelmas Term, 43 undergraduates from 10 colleges, and 11 ladies from 2 colleges; in Lent Term, 41 undergraduates from 11 colleges, and 20 ladies from 4 colleges; in the Summer Term, 24 undergraduates from 7 colleges, and 18 ladies from 4 colleges. In addition, there were usually at each lecture one or two graduates and two or three students not attached to the University. A pleasant evidence that the work is not wholly without effect, is to be found in the fact that a tutor and his pupils in one of the colleges asked me to supplement my public teaching by giving to them a short course of private lectures.

"In conjunction with Mr. Chisholm, I again 'awarded' in the geographical examinations of the Oxford and Cambridge Joint Board.

"In London, I have delivered a course of 25 lectures at Gresham College on Europe, Asia, and Northern Africa. This course was organized by the London University Extension, and was subsidized by your Society. It was attended by some 200 teachers drawn from all parts of the metropolis. Half of the class wrote weekly essays for my assistant, Mr. W. G. de Burgh, of Merton College, and these were examined with satisfactory results at Christmas and Easter, by Mr. A. J. Herbertson, of Herriott-Watt College, Edinburgh.

"I have delivered 28 geographical lectures at the London School of Economics. The class, though small, was remarkable for the number of students which it contained from foreign universities, chiefly Russian, Japanese, and American.

"At the invitation of the Senate of University College, Liverpool, I have delivered, at that college, 5 lectures on the Teaching of Geography before an audience of some 600 teachers of all ranks. I have also lectured on the same subject at Toynbee Hall to about 150 London teachers.

"The period of ten years during which your Society has shared with the University the maintenance of the Readership in Geography is now ended, but the University has decided that the office shall not lapse. You will, I trust, agree that this justifies your policy.

"*May*, 1897."

Mr. Yule Oldham reports as follows on the position of geography at Cambridge during the past year:—

"I have much pleasure in submitting a report on my work in the present academic year, in which a marked advance has been made.

"In the October term I was requested to give the first part of a course of lectures on the Geography of Europe for historical students. The attendance numbered 24, 7 being ladies. Nearly half of the class attended a supplementary series of lectures on cartography with practical work. At the second part of this course, in the Lent term, the attendance rose to 37, of whom 11 were ladies, either students from Girton or Newnham, or more advanced students from the Cambridge Training College. In addition, I lectured on Physical Geography for geological students; and in the Lent term, in conjunction with the University Lecturer in Geology, lectured on the Scientific Study of Scenery to an audience averaging 30 in number.

"My lectures for historical students were attended by 3 College lecturers, of whom 2 were members of the Historical Board, and, as a direct result of the lectures, Geography has received the practical recognition of being introduced as an essential part of the new revised historical Tripos.

"In August, at the meeting of University Extension students held here, I lectured to an audience of many hundreds on the Evolution of the Map of Africa; and last term I gave a short course of lectures, on the Teaching of Geography, to a large number of teachers and students at the Cambridge Training College.

"As one result of the success attending my lectures this winter, the Council of the University has granted a sum of £50 for the purchase of geographical apparatus, and this has been added to by a handsome donation of a similar sum from Dr. Nansen.

"To an important book on the 'Aims and Practice of Teaching,' recently issued by the University Press, I have contributed, by request, a chapter on the teaching of geography.

"There is every reason to expect that the advance made this year

will be maintained, if not increased, in the coming academic year, in a way which I hope will be deemed not unworthy of the considerable efforts made here by the Society.

"King's College, Cambridge,
"*May* 14. 1897."

ADMIRALTY SURVEYS DURING THE YEAR 1896.

Under the orders of the Lords Commissioners of the Admiralty, hydrographical surveys have been in progress round the shores of Great Britain and Ireland, on the west coast of Newfoundland, the Mediterranean, West Indies, east coast of North America, Bermuda, Tasmania, and Queensland; also in the South Pacific, among the Fiji group, and some of the other islands.

These surveys have been carried on by seven steam-vessels of war and three hired steam-vessels, manned by 69 officers and 639 men.

A naval officer has also been employed with the sanction of the Admiralty, under the Indian Government, in charge of the surveys in Indian waters. The results of the work accomplished are also mentioned here.

A detailed report of the labours performed by each surveying ship has been prepared, and, in accordance with custom, has been presented to Parliament.

The following is a brief summary:—

Notwithstanding the progress of hydrography, and the constant employment of our own and foreign surveying vessels in many parts of the world, the requirements of modern steam navigation increase more rapidly than the advance of surveys. Reports are constantly being received from various sources of the discovery of rocks and shoals, and during the year 1896 no less than 209 of these dangers to navigation required to be notified to the public by notices to mariners.

On the shores of the United Kingdom a detailed survey of Kirkwall, in the Orkney Islands, and its approaches, which had been commenced the previous year, was completed. In the Faroe channel a series of observations of temperatures at different depths, and a collection of water-samples, were obtained, in continuation of former observations in the same locality. An apparatus, devised by Dr. G. H. Fowler, for the collection of living forms from definite depths, was also experimented with, with considerable success. By means of an improved form of Pillsbury's meter for observing undercurrents, a reliable series of tidal current observations of great interest was obtained, at depths from 100 to 110 fathoms.

The triangulation of the Firth of Forth, between Long. 3° 2′ W. and a meridian 2 miles west of the Forth bridge, was taken in hand, and a chart prepared, on a scale of 4 inches to the nautical mile, ready for sounding during the next season.

In the estuary of the Thames, the shingles patch in the Duke of Edinburgh channel was re-sounded, and in the Medway river, Gillingham and Pinup reaches were re-surveyed on a scale of 20 inches to the sea mile; also Long reach as far as Bishops ness, besides an examination of the Lapwell bank and other small examinations of various localities.

A re-survey of the Downs, Goodwin Sands, and adjacent coast, was carried out on a scale of 2 inches to the sea mile, and considerable alterations found to have taken place in the offlying banks since last examined in 1887. The Goodwin Sand has continued its general movement towards the coast, and the area of drying sand has largely increased.

In the Straits of Dover observations were made with the current-meter, those in the Pas de Calais showing that the whole mass of water, from the surface to the bottom, ran at the same speed and turned in its direction at about the same time.

The harbour and approaches of Newhaven were resurveyed on a scale of 20 inches to the sea mile, the result showing great changes near the piers, especially on their eastern sides.

An examination of the spoil ground at Spithead showed that the deposit from the dredges, which have been at work for two years in Portsmouth harbour, has made no appreciable difference in the depth.

A resurvey of Portsmouth, having become necessary on account of the extensive dredging that has been going on, was commenced, and a large portion completed on a scale of 29 inches to the sea mile.

On the coast of Ireland, Dungarvan bay has been resurveyed on a scale of 4·5 inches to the sea mile, several uncharted rocks being discovered there.

The whole of the harbour of Berehaven has been resounded, and no less than twelve previously unknown rocks placed on the charts, but none of them are situated in the anchorage ground for large ships.

A resurvey of Killary bay and approaches, including the main channel in, was made on a scale of 6·9 inches to the sea mile, and led to the discovery of several hitherto uncharted rocks.

At Westport, a plan of the bay and approaches was made, on a scale of 6·9 inches to the sea mile.

The dredged channels at the entrance of Lough Carlingford, and the positions of some lately reported rocks near Larne, were ascertained.

On the coast of Newfoundland, about 47 miles of coast, from Bonne bay towards Rich point, have been surveyed, as well as a portion south of the Bay of Islands. The results showed that the published charts of this locality were considerably in error, both in contours and positions. A small plan of Portland cove was also made.

In continuation of the off-shore soundings off the coast of Nova Scotia, to enable vessels approaching the coast to fix their position, an area of 1800 square miles was well sounded out, and much valuable information obtained.

The harbour of Louisburg, in Cape Breton island, which has become a coal-shipping port, was resurveyed on a scale of 8 inches to the sea mile.

At Bermuda, the survey of the Narrows, or Ship channel, was completed, parts of the bottom having been examined by divers. This survey has shown that with only a small amount of work, the passage can be made safe for the larger ships of the present day. Examinations were made of the Stag channel and Two Rocks passage, which have been lately dredged; and the Crawl and Bailey flats were sounded out, as well as a portion of the Great Sound.

At Belize, in British Honduras, a survey was commenced of the harbour and approaches, which already shows shoaler water to exist in portions of the harbour than is at present shown.

In the Mediterranean, surveying operations have been carried on on the coast of Greece. In the Gulf of Corinth, plans on a scale of 6 inches to the sea mile have been made of Vostitza bay and ports Galaxidi and Salona, with the discovery of four previously uncharted rocks. The northern coast of the gulf between Psaromyta, Cape Nikolo, and Cape Velanidia has been completed on a scale of 2 inches to the mile, as also the southern shore from Gyphlissa point to Argo peak.

Both telegraphic and chronometric meridian distances were obtained between Patras and Malta, and a telegraphic meridian distance between Patras and Corinth.

In Tasmania, a survey was made of Wedge bay and the adjacent coast of the Tasman peninsula from Frederick Henry bay to Port Arthur on a scale of 2 inches to the mile; and a triangulation completed of the south-east extremity of the Tasman peninsula.

On the coast of Queensland, the survey of the inner route has been continued and completed between Restoration island in lat. 12° 37′ S. and Binstead island in lat. 13° 13′ S. The Pearn reef, which has on several previous occasions been unsuccessfully searched for, having been originally reported by a small pearling schooner, was found. It consists of a small coral rock with only 10 feet of water over it, and as it lies almost exactly on the track of vessels using the inner route, its discovery will probably avert a disaster. Sectional lines of soundings outside the reef were obtained at the Grafton and Palm passages.

In the islands of the South-West Pacific, Funafuti island in the Ellice group was surveyed on a scale of 2 inches to the sea mile, and the anchorage on 6 inches. At this island, Professor Sollas, F.R.S., and a party were landed to conduct boring operations, which it was hoped would aid in elucidating the structure of coral atolls. These operations were carried out at two positions to depths of 100 and 70 feet respectively, when in each case they had to be abandoned owing to the presence of quicksand and boulders, which prevented further advance without special gear. Sectional lines of soundings were run out from the reef at several places round the atoll to determine its outer slope.

At Nukulailai island, also one of the Ellice group, a sketch-survey was made, and a sketch-plan of the anchorage.

The island of Rotumah and neighbouring islets was surveyed, and a plan of the anchorage made.

The north coast of Viti Levu, Fiji, with its extensive tract of off-lying reef, was surveyed between Nakorokoro point and Mathuata island.

In the course of voyages and of searches for reported reefs, a large number of deep-sea soundings have been obtained in the South-West Pacific. Various banks were disproved, while others were verified and sounded, and a new bank was found. Magnetic observations have been obtained at Funafuti (Ellice group), Levuka (Fiji), and at Cairns (on the Queensland coast).

In India, work was commenced on the Sind coast, and coast-line and soundings for 20 miles off shore completed between Kori and Godia creeks.

The eastern part of Bombay harbour was surveyed on a scale of 2 inches to the sea mile, and large-scale plans of the approach to the Government docks.

The north-east end of North Andaman island was surveyed on a 1-inch, and Port Cornwallis on a 3-inch, scale.

During the year the Hydrographic Department has published 87 new charts and plans, and 20 plates have been improved by the addition of 25 new plans, while 4331 corrections have been made to the chart plates. The number of charts printed for the requirements of the royal navy, for Government departments, and to meet the demand of the general public has amounted to 344,118.

THE CENSUS OF THE RUSSIAN EMPIRE.

THE first general census in the Russian Empire, which was taken on February 9, 1897, is completed, and the collected materials are now verified on the spot, while a considerable portion of them has already been transmitted to the central Statistical Committee. The chief Census Committee has asked, in the mean time, all local

census committees to communicate to St. Petersburg the details of their results, which was done, partly by telegraph, for all provinces, with the exception of parts of the province Yakutsk, for which the returns had to be supplemented by estimates. The general items are now published in the *Official Messenger* (May 16, 1897) in the shape of two tables. The first table contains the population, according to the new census (males and females separately), for each of the eighty-nine governments and provinces of the empire, the superficies of the same, the density of population per square verst, and the percentage of females, as well as the total items for each province according to the ninth census of 1851, and the subsequent estimates of the central Statistical Committee for 1858 and 1885. The second table gives a list of the capitals of each province, and all towns having a population over 25,000.

Previous censuses, the last of which took place in 1851 and 1858, were made, for fiscal purposes, by the police, which gave the permanent residents and tax-payers at each spot. This was, on the contrary, a one-day census—the first made in all the Empire—in which every person which was in a given spot on February 9 (about that date in the villages) had to be mentioned in the house to house lists for that spot, whether permanently residing in it or not.

The general items appear as follows :—

	Population.		Females per 100 males, 1897.	Density per sq. mile, 1897.
	Feb. 9, 1897.	1851 (Köppen).		
European Russia (50 governments) ...	94,188,750	52,797,685	102·8	8·0
Kingdom of Poland (10 governments) ...	9,442,590	4,852,055	98·6	30·6
Caucasia (11 governments and provinces)	9,723,553	4,436,152	89·5	8·6
Siberia and Sakhalin (8 governments and provinces)...	5,731,732	2,437,184	93·7	0·2
Steppe region (5 provinces)	3,415,174	1,220,654	89·4	6·5
Turkistan, Transcaspian region and Pamirs (5 provinces)	4,175,101	—	83·0	1·4
Russian settlers and subjects in Bokhara and Khiva	6,412	—	60·0	—
Total, according to census ...	126,683,312	65,743,730	99·9	2·5
Grand Duchy of Finland (annual figures, for 1897 and 1851)	2,527,801	1,636,915	102·2	3·2
Total, Russian Empire	**129,211,113**	**67,380,645**	**100·0**	2·5

It would thus seem that the population has nearly doubled within the last fifty years.

As to the density of population, it is highest in Poland (47·4 per square mile in Piotrków); next come South-West Russia (29·7 in Podolia, 28·8 in Kieff) and Southern Russia (23·1 in Poltava); while in Middle Russia the density is about eighteen per square mile, and of course very much more in separate districts.

The population of towns has rapidly increased lately, there being now nineteen towns which have more than 100,000 inhabitants: namely, St. Petersburg, 1,267,023 (with suburbs); Moscow, 988,610; Warsaw, 614,752; Odessa, 404,651; Lódz in Poland, 314,780; Riga, 282,943; Kieff, 248,750; Kharkoff, 170,682; Tiflis, 159,862; Wilna, 159,568; Tashkent, 156,506; Saratov, 133,116; Kazan, 131,508; Ekaterinoslav, 121,216; Rostoff-on-Don, 119,889 (149,201 with Nakhichevan); Astrakhan, 113,075; Baku, 112,253; Tula, 111,048; and Kishineff, 108,506. There are besides thirty-five towns having a population of over 50,000 inhabitants, and sixty-nine more towns whose population is in excess of 25,000.

It is, of course, very interesting to compare the previous estimates with the present definite data. Having carefully compiled, during the last ten years, for the 'Statesman's Year-book,' all isolated data concerning population that were published by the local statistical committees, relative to different years, and having calculated from these figures the estimated population, according to the probable increase, I arrived at the following figures for the end of 1895: European Russia, 95,750,000; Poland, 9,220,000; Caucasus, 8,600,000; Central Asia, 6,375,000; Siberia, 5,140,000; Finland, 2,460,000; total, Russian Empire, 129,545,000 ('Statesman's Year-book,' 1897). These figures were, as might have been expected, and is now seen, in default for Caucasia and Turkistan, as also for Siberia, and in excess for European Russia, the total differing from the census figures by about one per cent. only.

The census was organized and carried on by a special committee, under M. P. P. Semenoff, who was, in 1869, the organizer of the first one-day census in Russia—namely, at St. Petersburg—and has since developed the system in all details. A considerable number of men, many of whom were volunteers, took part in this immense work. Notwithstanding the considerable obstacles offered by the immensity of the territory and the difficulties of communication with the villages, the census was a decided success. There were, of course, some regretful incidents, due to the hostility of the population to all censuses, which are considered as preliminary to new taxes.

P. K.

THE MONTHLY RECORD.

EUROPE.

The Gradual Extinction of the European Bison.—In the second number of volume iii. of the 'Memoirs of the St. Petersburg Academy of Sciences' (8th Series—Physical Mathematical Class), Eugene Büchner discusses the question of the gradual dying out of the *Bison bonassus* in the forest of Bielowyesha (Lithuania), adducing statistics to show that such a process is really going on, and investigating the causes to which it may be ascribed. He gives tables showing the approximate numbers of the bisons for each year from 1832 to 1892, from which it may be seen that, whereas from the former year to about 1855 the numbers were increasing, reaching a maximum of 1898 head in 1857, from that date onwards a diminution has on the whole been observed. The lowest figure (380) is given for the year 1889, but, as the writer shows that implicit reliance cannot be placed on the figures, the apparent slight increase since that year cannot be taken to show that a real improvement has set in. Herr Büchner discusses in turn the damage effected by various causes, such as the intentional killing of the bisons, either by authorized or unauthorized persons; the despatch of specimens to various zoological gardens; the destruction by wild beasts, especially bears and wolves; the disturbance caused by the two Polish insurrections; the diminution in the area of the pasture grounds, and so forth. But, while allowing that many of these have operated in the past—the effects of the big "drives" set on foot for the capture of living specimens being especially detrimental—he considers that, with the increased care exercised in recent years for the preservation of the species, none of these causes are sufficient to account for the gradual progress towards extinction which is undoubtedly going on. He looks rather to the increasing unproductiveness of the bisons themselves as the cause, and, dismissing various theories by which it has been sought to account for this characteristic, considers that it is due to the continued in-breeding which has of necessity been maintained. The same cause, he thinks, may account for the disappearance of the great post-tertiary mammals, which has never been satisfactorily explained, so that the study of the present condition of the Lithuanian bison may

lead to useful results with regard to the broad questions of the continuance or disappearance of species.

The Pinzgau.—Dr. William Schjerning gives a geographical description of the Pinzgau, one of the least-known parts of the Eastern Alps, in the last number of Kirchhoff's *Forschungen zur Deutschen Landeskunde*. The valley of the Salzach, between which and the High Tauern mountains lie the glaciers and highest peaks, does not lead to any pass like the valley of the Inn, and there has consequently been no traffic to open up the country. The Pinzgau has three distinct divisions: the limestone Alps in the north, reaching 8641 feet, whose jagged summits can be seen from Salzburg; the Salzburg slate Alps, 7765 feet, which lie immediately to the north of the Salzach valley, and the central chain rising in the Gross Venediger to 10,246 feet, whose peaks do not come into view until the upper valley of the Salzach is reached. These divisions are so marked that they have received special local names. The central chain is called the Kees Gebirge, or Glacier mountains; the slate mountains are called the Gras Gebirge, from their rich pastures; and the bare limestone Alps are called the Stein Gebirge. The illustrations have been chosen to show the results of weathering of the harder and softer rocks, as in the case of the granite mass of the Wilderglosspitze on p. 177, the smooth outlines of the Hundstein in the slate Alps on p. 97, and the bare Breithorn in the limestone Alps on p. 129. The upper valley of the Salzach has been much subject to inundations in former times, as a result of the felling of the lower forests, and many houses have been nearly buried by the rubbish brought down by the lateral streams; but the precautions of the Austrian government have made the valley secure against all ordinary floods. Small lakes are numerous in all three divisions except the limestone Alps, where the water cannot collect in this way. Most of them are the results of the Ice age. The largest glacier is the Obersulzbach Kees, 1 mile by 4 miles, which lies to the south of the Venediger group. Like the other glaciers of the Pinzgau, it is diminishing. The limit of the snow-line is about 8844 feet in the south, and 8533 feet in the north. Not much is known with regard to the damage done by avalanches, which shows that the district has enjoyed a comparative immunity. The author deals, in conclusion, with the former existence of glaciers in the two other divisions, and the influence of the Ice age on the conformation of the hills.

Geographical Education in the German-speaking Parts of Europe.—In the April number of *Petermanns Mitteilungen* there is a list of classes held and courses of lectures being delivered at the universities and higher schools in the German Empire and the German parts of Austria and Switzerland on geography and allied subjects during the summer session of 1897. From this list it appears that 85 professors in the German Empire, 20 in Austria, and 9 in Switzerland are engaged in such work, and if we omit the courses in geology and meteorology, and general courses in statistics, anthropology, and ethnology, we find 51 professors in the German Empire, 11 in Austria, and 5 in Switzerland, giving courses in subjects that may be held as belonging more strictly to the domain of geography, the number of courses being 98, 17, and 16 respectively. Of these courses, 6 are on the Determination of Positions, 5 on Mapping, 1 on the Determination of Altitudes, 1 each on the Distribution of Plants and Animals, 4 on Historical Geography, 4 on Commercial Geography (3 in Germany and 1 in Switzerland), 4 on Colonial Policy, and 2 on Applied Statistics, and 22 of the courses are classes held for geographical exercises. It would shed an instructive light on the difference of the estimation in which geography is held as a branch of the higher education in this country if we had for comparison a similar list for the United Kingdom, and in the absence of such a list it may be worth while to point out that in the list of University Extension summer courses given in the April number of the *University*

Extension Journal, there are only 5 geographical courses, and even if we double this number so as to take into account the courses held after lectures, which may be compared to the exercise courses mentioned above, then we have only 10 summer courses in England (in addition to any regular university courses that may be going on) to compare with the 131 courses in German Europe.

ASIA.

Illustrations of Ceylon Antiquities.*—In his superbly illustrated volume recently published, Mr. H. W. Cave gives the results of a tour made in 1896 for the purpose of examining the antiquities of "Lanka," the sacred land of Buddhism, the story of whose golden age reads more like a chapter of romance than a record of sober historical facts. Familiar as parts of the island paradise of the East have become to Englishmen of the present day owing to the facilities afforded, even to passing visitors, for obtaining a glimpse of the picturesque scenery of the interior, to the majority even of actual residents in the island, the ruins of ancient cities, situated in the more northern districts, with their wonderful rock-hewn temples, remains of palaces and monasteries, sculptured statues and carved work of various kinds, are known only in name. Mr. Cave's lucid descriptions, together with the large number of excellent illustrations reproduced from his own photographs, give a vivid idea of the architectural wonders lying hid among the northern jungles, and will, we doubt not, arouse a wish in many of his readers to make a personal inspection of these interesting relics of the past. One cannot but be struck with the contrast exhibited between the former history of the island and its condition within the last few centuries, and we ask with wonder what was the race of men whose genius raised these mighty structures, and who lived in a state of culture so different from that of their degenerate successors at the present day. The answer is in this case supplied by history, for, as Mr. Cave points out in the opening chapter, not one of the ruins dates back further than the introduction of Buddhism into Ceylon, but they may all be ascribed to the outburst of religious enthusiasm which followed on that event, and which permeated with its influence the whole life of those ancient cities, as evinced by their existing ruins. The sacred city of Anuradhapura was, as is well known, the centre of the kingdom when at the zenith of its prosperity, and naturally the greater part of the book deals with its edifices, among which it is difficult to say which most impresses the imagination. The Ruanweli Dagaba, shown on Plates xiv. and xv., is a fine example of the stupendous structures which compare in size with the very hills themselves. Specimens of carved work may be seen in the cluster of pillars shown on Plate xviii., whilst the picture of the Isurumuniya Temple (Plate xii.) gives an instance of the massive simplicity attained by hewing the solid rock. Equally striking and less known are the antiquities of Sigiri and Polonnaruwa, which could only be reached by rough jungle tracks. But to gain an adequate idea of these or any of the ruins, Mr. Cave's photographs must be consulted.

A Recent Journey in Korea.—The report of a journey across Korea, made in the autumn of 1895 by Mr. Willis, assistant in the British Consulate at Seul, accompanied by the Rev. S. O. Warner, a missionary, has been kindly forwarded to us by the Foreign Office. The route led through the province of Kang-won, one of the least known in the peninsula, keeping considerably to the east of the main road from Seul to Wonsan, followed by Mr. Carles, Mr. Campbell, and other travellers. At about 15 miles from the capital a hilly country was reached,

* 'The Ruined Cities of Ceylon.' By Henry W. Cave, M.A. Illustrated with photographs taken by the Author in the year 1896. London: Sampson & Low. 1897.

consisting of a succession of confined valleys, shut in by steep well-wooded hills. The population was scattered in small hamlets, and the amount of cultivation was small. The northern branch of the Han river, down which Mr. Willis learnt that a considerable amount of grain passes at one season of the year, was repeatedly crossed. The Kang-won province was reached by a pass about 1200 feet high, and after crossing the well-cultivated plain of Chun-chon a hilly country was again reached, the wider valleys containing small country towns, at which fairs are held two or three times a month. In spite of the general squalor of the dwellings, evidences of agricultural prosperity were noticed, and British piece-goods were found to be in favour. The country, however, is totally destitute of roads. Mr. Willis and his companion spent two days in crossing the mountain chain that runs parallel to the east coast, and has here an average height of 2500 to 3000 feet. The scenery was exceedingly wild and varied, the path now leading along the bed of a mountain torrent, and now ascending the mountain side through forests of oak, pine, and maple. Except an occasional hunter or woodcutter, the only inhabitants are monks, who have several large monasteries in the district. Having reached the east coast—here open and exposed, but with now and then a fishing hamlet protected by a low promontory—the travellers struck inland in order to visit the monasteries of the Diamond mountains, and soon joined the route travelled in the opposite direction by Mr. Campbell in 1889, the last part of the way to Wonsan (Gensan) leading along the high-road from Seul. In spite of the recent development of trade of Ping-yang on the western side of the peninsula, towards which most of the imports *viâ* Wonsan formerly went, the latter port was in a particularly flourishing state in 1895, principally owing to the recent discoveries of gold in the Han-kyong province. Mr. Willis returned to Seul by a coasting steamer, and was thus able to learn something of the possibilities of the coasting trade. Massampo, on the south-east coast, possesses an excellent harbour, though the place has apparently no great commercial possibilities.

The Geology of Java.*—This book contains a detailed account of the author's work of geological exploration, extending over six years of actual surveying. It is an official publication of the Dutch government, and forms, in connection with the synoptical geological map of 1 : 200,000, on which it serves as a commentary, the latest and most complete information on the geology of Java and Madura, which is geologically a part of Java. Owing to the improbability of a more complete geological survey leading to the discovery of useful minerals which would pay the expenses of such a work, the author has been obliged to content himself with a general sketch of the geology of Java, with a more detailed description of certain districts. It is unfortunate that a book of nearly twelve hundred pages, containing such varied material, is unprovided with an index. Owing to the great length of Java, which is approximately the distance from Paris to Vienna, and the fact that the political residences do not correspond to geological boundaries, two great divisions have been made in the work. The first, which forms the main body of the book, deals in detail with the geological formations of each residency; the second with the general geology of Java. There is also a special section on useful minerals, and a catalogue and description of many characteristic rocks and fossils in the Batavian museum. Except petroleum and building-stone, which are at present worked in small quantities, the result of the survey confirms the belief in the non-existence of mineral resources of commercial value. There is a bed of coal of some extent in the south of Bantam, but its position is too unfavourable

* 'Description Géologique de Java et Madura.' Par Dr. R. D. M. Verbeek et R. Tennema, Ingénieurs en chef des mines des Indes Neerlandaises.

to make it probable that it will ever be worked. Madura, which is described as one of the residencies, has no mountains, the highest point being 1544 feet, but has a large number of rivers on the whole more navigable than those of Java. It is noticeable that these rivers rarely possess a name of their own, but change according to the villages on their banks. Java is very largely mountainous, having fourteen peaks over 9800 feet, and forty-five over 6500 feet. The majority of the volcanoes of Java were active in the Tertiary epoch, and, though it is not quite true to say that there have been no eruptions of lava in recent times, there have probably been none of great importance. The eruption, however, of the neighbouring volcano Krakatao in 1883 shows that great eruptions are not limited to prehistoric times. As a rule, however, these eruptions have been confined to volcanic dust and ashes, which have gradually hidden the old craters, and formed the conical hills which are so prominent a feature in the scenery. The older the volcano—that is to say, the longer since it ceased to be active—the less perfect is the form of the crater owing to erosion. The heaping-up of material and flow of lava round a central point destroys in most cases the old form of crater; but in Java, as in Sumatra, there is a certain number of embryonic volcanoes which ceased to be active soon after they were thrown up. All the summits above 6500 feet, and many of less altitude, are volcanic. The disintegration of the volcanic rocks also produces great fertility of the soil. In quaternary times Java was joined to Sumatra, and it would only be necessary for the ocean bed to raise about 25 fathoms to re-establish the connection.

The Danish Expedition to the Pamirs.—This expedition, which was headed by Lieut. Olufsen, has returned to Copenhagen after a year's absence. Some details respecting it are to be found in *Aus allen Welttheilen*, 1896–97, p. 354, and in the *Comptes Rendus* of the Paris Geographical Society, 1897, p. 103. The exploring work of the expedition was directed chiefly to the country between the Pami-daria and the Panj, which had been hitherto untraversed by white men. The mountains of this region reach a height of 14,000 to 16,000 feet, and are broken by many streams flowing to the Panj. The expedition is said to have discovered a primitive race of small stature, living in caves and stone huts, and using no other weapon than the crossbow, with which, however, they are very expert. One account says that their domestic animals are also marked by their extremely small size.

Exploration of Lake Baikal.—A hydrographical expedition for the exploration of Lake Baikal, under Lieut.-Colonel Drizhenko, started on May 8 from St. Petersburg. It expects to begin its work in a fortnight, and to return in October. Soundings of the lake, surveys of the coasts, and natural history explorations are to be made.

Emigration to Siberia.—According to a work, just published, by State Secretary Kulomzin ('Statistical Data Relative to Siberia'), no less than 173,044 persons emigrated from European Russia to Siberia during the first ten months of 1896. Of those, 161,414 emigrants took the Siberian railway, and the remainder went by steamer, from Tiumen to Tomsk. The emigrants are chiefly peasants from the governments of Kursk, Kharkoff, Penza, and Chernigoff, where, owing to the increase of population, the land allotments become very small.

Dr. Sven Hedin's Journey in Tibet.—The Russian Geographical Society has received news from Dr. Sven Hedin, stating that he has made a successful journey across Northern Tibet by a route somewhat to the south of Pyevtsof's. Twenty-three new salt lakes are said to have been discovered *en route*. The journey was continued by way of Mongolia to Peking.

AFRICA.

A Tour through British Central Africa.—The *British Central Africa Gazette* for March 15 contains the account of a journey to lakes Tanganyika and Mweru by Mr. John Gibbs, manager of the African Lakes Corporation. It was made with a view to inspecting the various stations of the company, and inquiring into the prospects of trade generally in the country with which it has dealings. Mr. Gibbs's narrative gives a striking idea of the progress which has been made in the opening up of the country within the last few years, flourishing trading and mission stations being scattered over its length and breadth, in addition to those occupied by officers of the administration.* Substantial brick houses have been built in many parts, and more are in course of construction, while experiments in the cultivation of European vegetables have met with considerable success. It has been proved, also, that horses can be imported to the Nyasa-Tanganyika plateau from the coast. Mr. Gibbs extended his journey to the north end of Tanganyika, visiting the Belgian and German stations on the lake, and receiving a cordial welcome from the officers in charge. He everywhere found trade increasing, and showing unlimited possibilities of further development. Throughout the British territory the natives had settled down to peaceful occupations, and were living on good terms with the white men.

The French in the Bend of the Niger.—The political activity of the French in the regions of the Niger shows no signs of abatement. Anxious to secure a continuity of territory between the upper Niger and Dahome, they have long regarded Mossi as an important point to be occupied, and to this end expeditions were sent both from the north and south to converge on that kingdom. The *Bulletin du Comité de l'Afrique Française* for April gives some account of these expeditions. That from the north, under Lieut. Voulet, has occupied Wagadugu, the capital of Mossi, while that from the south, under Lieut. Baud, is said to have confirmed French influence in Gurma (also claimed by Germany), and joined hands with Lieut. Voulet on the frontiers of Mossi and Gurma. A third expedition, under Lieut. Bretonnet, has occupied Bussa, on the middle Niger, claimed by the Royal Niger Company.

Dr. Schoeller's Expedition in East Africa.—A note in the fourth number of *Petermanns Mitteilungen* for the present year records the progress made by Dr. Schoeller in his expedition to the Victoria Nyanza and Uganda (*Journal*, vol. iii. p. 175). He is said to have made a careful survey of his route, which led through some of the least-known districts on the east side of Lake Victoria. From Kilimanjaro he reached Kavirondo by way of Lotiko and Lubwa.

German-Portuguese Boundary in East Africa.—According to the *Deutsches Kolonialblatt* for April 1, the German-Portuguese boundary in the neighbourhood of the Rovuma mouth has been finally fixed by a mixed commission of the two countries, an alteration of the line as at first fixed having been shown to be necessary by the final testing of the astronomical observations. A map of the district, showing the details of the boundary, is promised in the *Mitteilungen aus den Deutschen Schutzgebieten*.

Dr. Baumann's Survey of the East African Islands.—Dr. Oskar Baumann, now stationed at Zanzibar as Austrian Consul, has done a useful piece

* We have received from Mr. Alfred Sharpe a map, by Bartholomew, showing the sphere of action of the African Lakes Corporation, with its various stations and those of the different missionary societies at work in the country.

of work in carrying out a careful survey of Zanzibar and the other islands lying off the East African coast. The work was performed with the support of the Leipzig Geographical Society, and the results, so far as relate to Zanzibar and Mafia, have already been issued as part of the scientific publications of that Society. By traversing the islands in all directions, Dr. Baumann obtained a clear general idea of their physical features, which are well shown on the maps which accompany the monographs. The distinction between the rocky coral formation, little suited for cultivation, and the alluvial or sandy soil, derived from the denudation of the former, is shown by a difference of tint (on a small inset map in the case of Zanzibar). Both in Zanzibar and Mafia the coral limestone occupies the eastern side, but, whereas in the former it includes more than half of the breadth, in the latter it is confined to a narrow strip along the east coast, with a continuation in the smaller islands to the south. The coco-nut plantations, which form the chief wealth of Mafia, are further shown by a distinctive tint, and in the case of Zanzibar, the clove-producing area, which lies chiefly to the north of Zanzibar city, is distinguished from the rest of the fertile portion of the island. Dr. Baumann's letterpress, which is intended as an explanatory supplement to the maps, gives a clear description of the surface features and topography of the islands, with sections dealing with the inhabitants, commercial and other resources, etc. In Zanzibar the coral limestone shows many of the features of a "karst" region, such as "chimneys," caverns, and underground streams. A good plan of Zanzibar city is given, though this is but briefly touched upon in the description, owing to the fact that more information has previously been available with regard to it than on the rest of the island.

The Population of Réunion.—M. L. O'Zoux gives, in the *Revue Française* of January last, a sketch of the various constituent elements in the heterogeneous population of Réunion, briefly describing the characteristics of each. The Malagasy are decidedly the best and most reliable labourers, the Hindus being said to be here characterized by idleness and drunkenness, although capable of severe labour. The negroes too are intemperate, and their delicate constitutions render them less useful as labourers than the Malagasy. The Chinese and Arabs dwell in the capital, either race carrying on its own special kind of trade. The Creoles—French emigrants from Normandy or Brittany, officials or traders—show much energy and application, and are marked by the close bond of union between the members of the family. Of late years a mulatto race has sprung up, which, though it makes its way slowly and is looked down upon by the Creoles, is bound in time to force its way to the front, and all the more readily as the days of large fortunes are over in the island, and equality is now the order of the day.

Reported Death of Captain Bòttego.—Telegrams from Zeila, said to be based on a letter from King Menelik himself, give the regrettable intelligence of the death of Captain Bòttego in the south of Abyssinia, in a fight with the natives. The fight is said to have been occasioned by the opposition of an Abyssinia chief to the entry of the Italian expedition into his country from the Galla countries to the south. By pushing his way so far north, Captain Bòttego must have performed a good piece of exploring work in this, as in his previous journey, and his untimely death is all the more to be regretted.

AMERICA.

The Physical Features of Missouri.—The Missouri Geological Survey has recently issued, as an extract from its reports, a paper by Mr. C. F. Marbut, one of its assistant geologists, and an enthusiastic disciple of Prof. W. M. Davis. Mr. Marbut gives a detailed topographical description of the state of Missouri, referring

the features described to the principles of land structure and development of which Profs. Davis and Penck are the recognized exponents, and his memoir is an admirable example of what physical geography, properly understood, can really accomplish—an example such as is, unfortunately, still rare in this country. The great feature of Missouri is the undulating upland plain, which presents an even surface rising and falling gently without any outstanding elevation, and forming a great block, from which have been carved the valleys of the existing streams and the broad shallow depressions, which extend along the strike of the softer rocks, and are due to their rapid degradation. The Missouri river roughly divides the upland region into two parts—the prairie region lying to north and west of it, and the Ozark region to south and east. Various hypotheses have been brought forward to account for the formation of this upland. Mr. Marbut adopts the view that the upland surface is a peneplain of a former cycle of erosion completed in middle or late Tertiary times, and that it was produced at a level lower than that at which it now stands, the present details of relief having been cut so rapidly and so recently that there has been no material reduction in the upland surface during the process. The fact that the Missouri drainage has been inverted within recent geological times is assumed from the evidence, but difficulties arise because it is not possible to fix the date of the inversion. If it took place at the beginning of the present cycle of erosion, then it follows that the prairie region was unequally elevated; there was no minor warping to speak of within the limits of the state, but the upheaval was greatest in the north-west, toward the Rocky mountains, and least along the border of the Ozark region. The "Ozark dome" was raised most along the present axis of greatest elevation, decreasing in amount in all directions, and it is a warped surface, the warping having occurred in the beginning of the present cycle, in middle or late Tertiary times. Having thus traced the initial condition of the upland, Mr. Marbut proceeds to point out how "step and platform" topography is developed by erosion of hard and soft rocks, in a manner largely dependent on the dip of their strata, to apply this scheme of development to the various platforms and escarpments—about half a dozen of each—found in Missouri. Then follows a note on the swamp region, a kind of exception found on the Tertiary rocks of the coastal plain, which extends from the south-eastern border of the Ozark region southward into neighbouring states. Finally, the development of the hydrography of the area on the upland plain is followed in detail. The terms "meander" and "shut in," and the like, have a definite enough geomorphological meaning, as appears clearly from Mr. Marbut's use of them, but we cannot help feeling that they sound crude and angular, more conformable in style to the German language than to our own. Possibly they may be improved in this country, in the event of the ideas they are meant to express becoming familiar to British students. It should be mentioned that Mr. Marbut's paper is illustrated by very satisfactory photo-engravings, and much less satisfactory maps.

Areas of South American River-basins.—The discrepancies in the figures given in geographical hand-books and text-books for the area of the larger river-basins outside of Europe have induced Dr. Alois Bludau to enter upon a new calculation of those areas based on the best available maps, and he contributes to the April number of *Petermanns Mitteilungen* the first results of those calculations. These embrace the river-basins of South America, and are based on the six-sheet map of that continent, on the scale of 1: 7,500,000, in Stieler's Hand-atlas. The calculation has been made in the usual way, partly by reckoning the entire degree-meshes included in a river-basin and multiplying out, and partly by measurement of the surplus fractions not filling an entire mesh. For this measurement he

has made use of Coradi's compensation polar planimeter. To afford some criterion of the accuracy of his measurement, he has not confined himself to the larger river-basins, but has included the smaller basins in groups, so as to make up the entire continent, and he thereby finds that his aggregate area is only 24,000 square kilometres (9265 square miles) short of the total area found for the continent by Wagner's latest calculations ('Beiträge zur Geophysik,' ii. pp. 699, 700). Below are given the results of Dr. Bludau's calculations for South American river-basins converted into square miles; but, as Dr. Bludau's figures are only for the nearest multiple of 1000 square kilometres, in the conversion the equivalent is given only for the nearest multiple of 500 square miles, and any discrepancy that may thus result between the total as obtained by conversion from Dr. Bludau's totals and the sum of the individual areas is not rectified:—

A. General Synopsis.

	Sq. miles.
1. Atlantic domain	6,284,000
2. Pacific	407,500
3. Region of inland drainage	105,500
	6,798,000

B. Atlantic Domain.

	Sq. miles.
1. Atlantic slope of the isthmus of Panama to the waterparting of the Rio Atrato basin	2,000
2. Rio Atrato...	24,500
3. Rio Magdalena	102,500
4. Maritime tract between the Rio Magdalena and the Orinoco, including the lagoon of Maracaibo ...	94,500
5. Orinoco	364,500
6 Maritime tract between Orinoco and Amazon (Cuyuni - Essequibo — Corentyne — Maroni — Oyapok)...	190,500
7. Amazon with Tocantins ...	2,722,000
8. Gurupi—Turi-assu ...	24,000
9. Pindare-Gusjahu, Itapicuru	61,500
10. Parnahiba	133 500
Carried forward ...	3,719,500

	Sq. miles.
Brought forward ...	3,719,500
11. Maritime tract between Parnahiba and São Francisco	106,500
12. São Francisco	251,500
13. Maritime tract between São Francisco and La Plata	333,000
14. La Plata with Uruguay ...	1,198,500
15. Colorado (Gobu—Leobú) and Rio Negro (Curru—Leobú)	464,000
16. Chubut and all other rivers to Cape Froward ...	210,000
	6,284,000

C. Pacific Domain.

	Sq. miles.
17. Pacific slope of Colombia	35,000
18. „ „ Ecuador	41,500
19. „ „ Peru ...	125,000
20. „ „ Chile ...	206,000
	407,500

D. Regions of Inland Drainage.

	Sq. miles.
21. Basin of Lakes Titicaca and Aullagas	76,000
22. Region to south of previous basin	30,000
	105,500

The Mineral Resources of Alaska.—By the courtesy of the Foreign Office, we have received a copy of a report lately made to the United States Senate by the Director of the Geological Survey, on an exploring expedition sent by that department in 1896 to the region of the Central Yukon, for the investigation of the gold-bearing formations of Alaska. The area reconnoitred by the expedition, which is shown on a sketch-map accompanying the report, comprised upwards of 30,000 square miles of country not previously examined by the geological survey. Mr. E. J. Spurr and two assistants crossed the Chilkut pass in June of last year, and passed down the Yukon to its mouth. During the passage through the gold-belt, which occupies the country within the great bend of the river, afterwards passing in a north-westerly direction to the northern bank, all the creeks and gulches known to be productive of gold were visited, in some cases by land journeys of several hundred miles. The gold-bearing formations consist of highly altered rocks, mostly

crystalline schists, probably in part of Devonian age. The gold occurs both in the quartz veins with which the rocks are traversed and in "placers" formed by the wearing away of the older rocks. In the vicinity of the latter the placers are sufficiently rich to be profitably worked. In the younger rocks of the district beds of very pure lignitic coal have been found, which will probably prove of great assistance in the development of the country. Other valuable minerals, including silver-bearing lead and copper, occur in many places. The gold belt extends into British territory, but so far the miners—of whom about two thousand were at work in the Yukon district in 1896—have preferred the American side. The co-operation of the two governments is recommended with a view to opening an overland route to the district, that suggested by Mr. Spurr leading from Juneau by the Chilkat pass to the Yukon-Pelly junction. Efforts will be made to extend the reconnaissance over the remaining unexplored regions of Alaska. Reference is made in the report to a recent exploration by prospectors of the unknown region lying north of Cook's inlet, which shows that the Sushitna river comes from a long distance inland, one branch having been followed to a large lake 350 miles from the sea.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Movement of Sand and Shingle on Coasts.*—The propositions which Mr. Wheeler desires to establish are—(1) that the vast deposits of sand and shingle in bays and sheltered places on the coasts are due to causes which occurred in remote ages, and which are no longer in operation; (2) that the drift which travels along a coast is due to the erosion of the cliffs, and is derived from the wasting of the land, and not from the sea-bed; (3) that the quantity of drift is limited, so that it may be entirely stopped or its movement controlled; (4) that, while wind and waves are the agents which operate in eroding the cliffs and producing the drift, the regular and continuous travel of the material along the coast is due to the wave-action of the flood-tide; (5) that the regular and continuous movement of sand and shingle along a coast takes place only in the zone lying between low and high water mark; (6) that the contour of the sea-bed on a sandy coast, when covered with a moderate depth of water, remains in a stable condition, and that so long as the conditions remain the same, the form of the banks and the depth of the channels are not altered by the winds and waves; (7) that channels can be effectively deepened and maintained on sandy coasts by dredging; and, if properly directed, they will remain stable and retain their depth; (8) that harbours may be projected out from sandy coasts without danger of the entrances shoaling, provided that the piers are so placed as to derange the main set of the tidal current as little as possible, and are carried into a sufficient depth of water, and that, where required, the supply of littoral drift is cut off by protective works along the coast. *Discussion and Correspondence.*—With respect to the third proposition, Sir G. Nares contended, in the discussion, that the wave-action caused by alongshore winds was the chief agent in the transport of shingle and sand as low down as wave-action extended. Admiral Wharton contended that proposition (1) could not be maintained, and cited the changes which take place in Yarmouth Roads. Mr. Wolfe Barry agreed with Sir G. Nares as to drifting action, and, while

* "Littoral Drift: in its relation to the Outfalls of Rivers, and to the Construction and Maintenance of Harbours on Sandy Coasts." By Wm. H. Wheeler, M. INST. C.E. *Min. Proc. Inst. C.E.*, vol. cxxv. (March, 1896), pp. 2–32; Discussion on the above, pp. 33–56; Correspondence, pp. 56–87.

concurring in the author's view that the drift of shingle, etc., may be checked by engineering works, demurred to the statement that it can in all cases be stopped. Mr. L. F. Vernon-Harcourt points out (in the correspondence) that the flood-tide comes from the direction of the ocean, which is also the quarter most exposed to strong winds and heavy waves. The majority of the engineers who took part in the discussion and correspondence dissent from the author's statement that the flood-tide is the predominating influence in littoral drift, which they ascribe to winds and waves. The opinions expressed are, on the whole, adverse to the author's proposition (1), but on the other points are more equally divided.

Earth-Crust Movements and their Causes.—In his annual address to the Geological Society of America, the President, Joseph le Conte, treats of the above subject in some detail.* His conclusions are summed up as follows: There are two primary and permanent kinds of crust-movements, namely, (*a*) those which give rise to those greatest inequalities of the Earth's surface—oceanic basins and continental surfaces; and (*b*) those which by interior contraction determine mountains of folded structure. These two are wholly determined by interior forces affecting the Earth as a whole, the one by unequal radial contraction, the other by unequal concentric contraction—that is, contraction of the interior more than the exterior. There are also two secondary kinds of movement, which modify the effects of the other two. These are: (*c*) those oscillatory movements, often affecting large areas, which have been the commonest and most conspicuous of all movements in every geolcgical period, and are, indeed, the only ones distinctly observable and measureable at the present time, but for which no adequate cause has been assigned and no tenable theory proposed; and (*d*) isostatic movements or gravitative readjustments, by transfer of load from place to place, by erosion and sedimentation, or else loading and unloading by ice accumulation and removal, and also by readjustment of great crust blocks. If the previous one (*c*) or oscillatory movements have marked and so obscured the effects of (*a*) continent and ocean basin-making, this last (*d*), isostasy, has concealed the effects and obscured the interpretation of all the others, but especially of (*b* and *c*) mountain-making forces and the forces of oscillatory movements. In the minds of some recent writers, it has almost monopolized the whole field of crust-movements.

The Gases dissolved in Sea-water.—Dr. K. Rördam having recently thrown some doubt on the methods of analyzing the dissolved gases in sea-water introduced by Prof. Pettersson, Dr. Martin Knudsen, chemist to the Danish expedition on the cruiser *Ingolf* in Iceland and Greenland waters, has made some experiments with a method not open to the supposed disadvantage of requiring the storage of samples in glass bulbs for a longer or shorter period till the return home of the vessel. In an account of these experiments published in the *Comptes Rendus*, Dr. Knudsen does not state any definite opinion as to the objections brought forward by Dr. Rördam, but he describes some further investigations, made in conjunction with M. Ostenfeld-Hansen, on the action of plankton. Samples into which large numbers of copepods were introduced soon had the dissolved oxygen reduced by half, while increase of carbonic acid, while samples to which diatoms were added had their oxygen trebled and carbonic acid reduced by one-fourth after three hours' exposure to light. It is difficult to see how these results, important as they are, affect any recent work involving gas analyses as a help in tracing the movements of bodies of water. Prof. Pettersson, to whom all such work is due, concerns himself with oxygen and carbonic acid only when dealing with biological questions; and bases any conclusions as to downward currents and the like entirely

* *Science*, February 26, 1897.

on the quantities of nitrogen. In accounting for the presence of quantities of oxygen greater than the sea-water could take up in solution, Dr. Knudsen seems to increase one's confidence in Pettersson's nitrogen results.

Ice-caves.—The March number of the *Journal* of the Franklin Institute, Philadelphia, contains a paper by Mr. Edwin Swift Balch, in which he discusses the subject of ice-caves, and the causes of subterranean ice. The term "ice-cave," in the author's opinion, should especially apply to the hollows in the ice at the lower end of glaciers, whence the glacier waters make their exit. Ice-caves differ greatly from ice-gullies, the former having a roof, which means that the ice is formed directly in the cave itself, and is not—except, perhaps, near the entrance—solidified snow, but genuine subterranean ice. They may be divided into three main kinds: (1) Those at or near the base of cliffs, entering directly into the mountain with a down slope. This class is found in limestone and in volcanic rocks. Examples: the Kolowratshöhle, Dobsina, Roth in the Eifel. (2) Those at or near the base of cliffs, where a long passage-way exists before the ice-cave proper is reached. This class is apparently found in limestone rock. Examples: Demenyfálva, the Frauenmauer. (3) Those where a large pit opens into the ground, and the ice-cave is found at the bottom opening into the pit. These are in limestone. Examples: Chaux-les-Passavant and La Genollière. Ice-caves proper are found in various parts of Europe, Asia, and America, mostly in the smaller ranges or in the outliers of the snowy ranges, and notably in the Jura, Switzerland, the Italian Alps, the Eastern Alps, in Tyrol, Steiermark, and Carinthia. There are some in Hungary, Russia, one in Iceland, one on the peak of Teneriffe, several in Siberia, one in Kondooz in Central Asia, one in Japan, and one in Korea. In treating of the subject of the cause of formation of the ice in caves, the author is of opinion that the cold air of winter is the chief factor, which reforms anew each year the ice which has been destroyed by the heat of the preceding summer.

GENERAL.

The Livingstone College.—The report of the Livingstone College for 1895–96, with a copy of which we have been favoured, shows that the institution is likely to supply a felt need by providing intending missionaries with instruction in the rules of health and special dangers of tropical climates, equally necessary for the sake of their own well-being as for the relief of the natives among whom they intend to work. The college has lately been extended so as to accommodate sixteen resident students. It is a work which would have had the cordial sympathy of the great explorer whose name it bears, and it may be hoped that it will do much to reduce the proportion of failure of health in the tropics from purely preventable causes.

OBITUARY.

J. Theodore Bent, F.S.A.

It is with much regret that we record the premature death of Mr. J. Theodore Bent, well known to the geographical world for his archæological explorations in various parts of Africa and South-West Asia. Mr. Bent had but recently returned from his last expedition to Sokotra and Southern Arabia, on which he had suffered severely from malarial fever. A chill caught on the way home brought about a relapse, and, pneumonia setting in, he succumbed after a short illness on May 5, at the early age of forty-five years.

The deceased traveller was the only son of the late James Bent, of Baildon House, near Leeds. His school-days were spent first at Malvern Wells, and afterwards at Repton, whence he proceeded to Wadham College, Oxford. After studying for the Modern History School, he graduated with honours in 1875. In 1877 he married Mabel, daughter of the late Robert Westley Hall-Dare, D.L., of county Wexford and Essex, who subsequently became his companion on all his exploring journeys. To escape the rigours of the English winter, Mr. and Mrs. Bent annually left their house in Great Cumberland Place to proceed to a more genial clime, and in this way they soon became thoroughly acquainted with many of the countries of South Europe. Mr. Bent had a remarkable facility for acquiring languages, and he was a fluent speaker both in Italian and modern Greek. In 1885 he embodied the results of his journeys in the Archipelago in a volume entitled 'The Cyclades; or, Life among the Insular Greeks.' His taste for archæological research led him, from 1889 onwards, to choose for his scene of action such districts as by their antiquarian remains presented problems relating to the history of the ancient nations or races of the East. In that year he visited the Bahrein islands, in the Persian Gulf, the result of his investigations being to show the great probability that the group was a primitive site of the Phœnician race. After a visit to Cilicia Tracheia in 1890, he, during the following winter, set himself to solve one of the most interesting questions connected with the ancient history of Eastern Africa and South-West Asia, viz. the origin of the ancient remains which had been discovered at Zimbabwe, in Mashonaland. A careful exploration of the ruins led him to conclude them to be the work of pre-Mohammedan inhabitants of Southern Arabia, who are known to have been an enterprising commercial people in very ancient times. Mr. Bent described the results of this journey in a book called 'The Ruined Cities of Mashonaland' (1892).

At the end of 1892, Mr. and Mrs. Bent again set out for Africa, this time to investigate the extensive ruins in the north of Abyssinia. This journey threw much new light on the early connection between the people of Abyssinia and those of South-West Arabia, whence both the writing and language of the old Abyssinians must have been derived. It is described in Mr. Bent's volume, 'The sacred city of the Ethiopians.' In the winter of 1893-94, Southern Arabia, the mother-country of both the peoples whose antiquities had been examined in the two preceding years, was visited, and a considerable addition made to our knowledge of the little-known Hadramut country. This was revisited during the succeeding winter, whilst that of 1895-96 was devoted to exploration on the African coast of the Red Sea. The last fatal journey is said to have resulted in the discovery of fresh archæological matter in Sokotra and Southern Arabia, in the latter of which some new ground was broken.

Mr. Bent's kindly and genial nature had endeared him to a wide circle of friends, by whom his loss will be keenly felt. To our Society, of which he became a Fellow and Member of Council in 1890, he always readily communicated the results of his journeys, and both the *Proceedings* and *Journal* bear witness to the wide range of his travels. Besides the works mentioned above, and various magazine articles, Mr. Bent in 1893 edited a volume on 'Early Travels in the Levant' for the Hakluyt Society.

Sir William C. F. Robinson, G.C.M.G.

The late Governor of Western Australia, who died at his residence in London on May 2, aged sixty-two years, had been a Fellow of our Society since 1870. Fourth son of the late Admiral Hercules Robinson, he entered the colonial service in 1855 as private secretary to his brother, the present Lord Rosmead, then Governor of

St. Kitts, in the West Indies. He subsequently held various important colonial appointments both in the East and West, and had twice been Governor of West Australia previous to his last tenure of the office in 1890–95.

Louis Pascal Casella, F.R.A.S., F.R.Met.S.

One of the older members of the Society has passed away in the person of Mr. Louis Casella, the well-known scientific instrument maker, who had joined its ranks in 1858. Although of Italian extraction, Mr. Casella was born in Scotland, but came to London at an early age, making it his home for the rest of his life. By his many improvements and inventions in scientific instruments, he had materially assisted the labours of more than one generation of travellers and explorers, his adaptation of the pressure-gauge to the verification of temperatures taken at great oceanic depths being perhaps one of the most important. During his long life, Mr. Casella was always ready to lend a helping hand to those who asked his assistance, and he enjoyed the deserved respect of all with whom he came in contact. He died at Highgate on April 23, aged eighty-six years.

CORRESPONDENCE.

Sand-dunes.

Loralai, Baluchistan, March 25, 1897.

Noticing the reference, at the conclusion of Mr. Cornish's lecture on sand-dunes, to "musical" or "sound-giving" sandhills (*Journal* for March, 1897, pp. 107, 108), it came into my mind that when in October, 1884, Colonel (now Sir West) Ridgeway's mission was marching northward from the Helmand towards Herat, we had passed and seen in the distance one of these "vocal sand" phenomena, and that I had said something about it in my 'Travels with the Afghan Boundary Commission.' I find my account of it (blended with a description of the Mohammedan superstitions regarding it) on pp. 112, 113 thus: "This great sand-drift, lying between two ribs on the south side of the Kuh-i-Kalah-i-Kah, and reaching more than halfway to its summit, is visible for miles around, and is a miracle in itself," etc. It was pointed out to me by the guide from a distance of 10 or 12 miles. The Goldsmid-Pollock Mission of 1872 must have visited this vocal sand-drift, as both Bellew and Euan Smith appear to describe it in their books. (I have not their books here at present for reference.) Captain MacMahon's description of mountain ranges with "sand banked up against their sides as high as 1000 to 2000 feet above the level of their base," depicts accurately the appearance of the vocal sand-drift of Imam Zaid. The range known locally as "Kuh-i-Kalah-i-Kah" lies some 30 miles north or north by west of Lash-Juwain in Sistan. In the midst of the Baluch desert between Nushki and the Helmand we saw one or more mountain ranges with the sand banked high up against their rugged rocky sides and wedged into the ravines. What struck me most was that the banking up was on the south side, while the prevailing wind was, to the best of my knowledge, from the north.

My first acquaintance with the power of sand was in the Afghan war of 1880, when I skirted in several places the eastern edge of the great Registan, which extends eastward from the Helmand to within a few miles of Kandahar, and within easy sight of the Khojak Tunnel. I just recall a great wall of sand (50 or 100 feet high?) bordered by the Dori river. When I next saw it was in October, 1884, on

its southern side. At Umar Shah (36 miles west of Nushki) it was burying a row of tall willow trees, just as Mr. Cornish describes the sand burying date palms in Egypt. There is nothing of the sand-dune about the Registan. That is a great sea of sand, in which, on a clear day, hills—and high hills, too—stand up as islands. It moves slowly eastward and south-eastward, as I gathered. Westward of the Helmand, too, there extends for 100 miles or more a great sand desert. When camped at Kalah-i-fath, we heard of an ancient buried city where after rain the natives unearthed many coins. It was suggested that this city might be Pasargadæ. This great Registan, east and west of the reach of the Helmand from Kalah-i-bist to Rudbar, is still food for the explorer, when the Amir of Afghanistan withdraws his embargo on European travellers. In and around it much may be learnt, including a good deal about sand-dunes. Registan, I may add, means "land of sand," or "great tract of sand."

A. C. Yate, Major,
2nd Baluchis.

Proposed New Terms in Geographical Distribution.

Animals are not, in most cases, generally distributed over the Earth's surface, but are confined to certain definite localities, which are called their "specific areas." Thus Africa south of the Atlas is the specific area of the giraffe and of the African elephant; they are found here and nowhere else. In the same way the sloths and anteaters are confined to tropical America, and the polar bear to the North Polar lands. Such animals may be called "*topo-politan*" (*τόπος, locus*, and *πολίτης, civis*) in contradistinction to those that are universally distributed, or "*cosmo-politan*." As regards species, cosmopolitan animals are rare, but when we come to the higher groups, such as genera, families, and orders, there are many forms that may be called "cosmopolitan," or, at any rate, "quasi-cosmopolitan." The dog-genus (*Canis*) is a good example of quasi-cosmopolitan genus of mammals. Dogs of various species occur in almost all lands, from the poles to the equator—even in Australia, where the mammals are generally so peculiar, although dogs are absent in Madagascar and in the Pacific islands. In the class of birds, some species are almost cosmopolitan, such as the sanderling (*Calidris arenaria*) and the osprey (*Pandion haliaëtus*), but by far the greater number of birds are "topo-politan," and in many cases are confined within very narrow limits.

The vast majority of natural groups of animals being "topo-politan," *i.e.* restricted to more or less definite areas on the Earth's surface, it follows that these various areas are characterized by the presence of certain forms of animal life which do not occur elsewhere. These forms it is proposed to call "*Topomorphs*." Thus the giraffe is a "*topomorph*" * of the Æthiopian region (Africa south of the Atlas); the sloths and anteaters are topomorphs of the neotropical region (South and Central America); the duck-bill and lyre-bird are topomorphs of Australia; and the kiwi (*Apteryx*) of New Zealand. On the other hand, in many cases the *absence* of certain forms of animal life in countries where they might be naturally expected to occur is a marked feature of certain parts of the world's surface. For example, bears (*Ursus*) and deer (*Cervus*) are altogether absent from the Æthiopian regions, and cats (*Felis*) from Australia, though these forms are widely distributed over other lands. It is proposed to designate such forms as "lipomorphs"† (λείπω,

* From *τόπος, locus*, and *μορφή, forma*.

† On a previous occasion (see *P.Z.S.*, 1882, p. 311), I have proposed to use "*lipo-type*" in this sense instead of "*lipomorph*." But the latter term is better, because "type" and its combinations are generally used technically in zoology to indicate the particular specimen from which the original description or figure of a species has been taken.

deficio, and *μορφὴ*, *forma*) as regards the particular areas in which they are *not* found. Thus bears and deer are "lipomorphs" of Africa south of the Atlas, and cats (*Felis*) of Australia.

The three new terms which I propose to introduce into the study of the geographical distribution of animals are therefore—

1. "*Topo-politan*" to designate natural groups of limited geographical range (in contradistinction to "cosmopolitan").

2. "*Topomorph*" = a group of animals limited to a particular district and characteristic of it.

3. "*Lipomorph*" = a group which characterizes a particular district by its absence from it.

P. L. Sclater, F.R.S.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1896-1897.

Eleventh Ordinary Meeting, May 10, 1897.—Sir Clements Markham, K.C.B., President, in the Chair.

Elections.—*Lieutenant R. A. E. Benn* (*Indian Staff Corps*); *George Rowland Blades*; *Stanley Victor Coote*; *Horace Cox*; *John Eugene Dawson, J.P.*; *Captain Henry Richmond Gale, R.E.*; *Ernest W. Grey*; *Douglas Menzies Hall*; *Walter Shilling Hill*; *Lieutenant Robert Richard Hubbard, R.N.R.*; *Captain E. Le Mesurier*; *John Arthur Ludlow*; *G. B. Macpherson-Grant*; *George Jackson Poulton*; *Lieutenant Dudley G. Seagrim, R.A.*; *Daniel C. Stapleton*; *Henry Morris Upcher*; *Rev. William Vivian*; *Lieutenant F. C. Webb Ware* (*Indian Staff Corps*).

The President said: Before proceeding to the business of the evening, I must allude to the loss we have sustained by the death of Mr. Theodore Bent. He generally, during the last few years, made interesting excursions into unknown parts of Arabia and Africa, and afterwards read us in this room most interesting papers; and, judging from the very large audience he always had, I am sure that these papers were fully appreciated. He was a very accomplished man, both as an archæologist and as a geographer, a charming companion, and a true friend; perhaps it would not befit me to dwell upon some of his still higher qualities. You will remember that his wife, Mrs. Bent, always accompanied him in his journeys, and shared all his hardships and dangers. I am sure that all of us will feel the deepest sympathy for Mrs. Bent in her great bereavement.

The Paper read was:—

"Recent Journeys in Szechuan, Western China." By Mrs. Bishop.

Afternoon Technical Meeting, Wednesday, May 12, *at* 4.30 *p.m.*—Sir Clements Markham, K.C.B., President, in the Chair.

The Paper read was:—

"Variation and Dip of the Magnetic Needle." By Arthur W. Horsburgh.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. Rd. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

EUROPE.

Alps. *Rev. G.* **40** (1897): 6–10. **Garnier.**

Note sur la répartition des langues dans les Alpes occidentales. Par Christian Garnier. *With Map.*

The map shows the distribution of languages in the western Alps, distinguishing Italian, French, and German (the two latter in three degrees of prevalence), and the old Ligurian patois.

Alps—Adamello District. *Sitzb. Preus. A.W. Berlin* (1896): 1033–1048. **Salomon.**

Geologisch-petrographische Studien im Adamello-gebiet. Von Dr. Wilhelm Salomon.

Alps—Mont d'Ambin. **Coolidge.**

W. A. B. Coolidge. Le Massif d'Ambin. Lyon: Imp. Mougin-Rusand, 1897. Size 10 × 6½, pp. 32. *Frontispiece and Sketch-map. Presented by the Author.*

A detailed account of the mountain region which lies between the tunnel of Fréjus (usually wrongly called the Mont Cenis tunnel) and Mont Cenis itself. This district, Mr. Coolidge states, has hitherto been somewhat neglected by alpinists.

Alps—Valleys. *C. Rd.* **124** (1897): 785–787. **Lugeon.**

La loi de formation des vallées transversales des Alpes occidentales. Note de M. Maurice Lugeon.

The author explains the geographical position of the transverse valleys of the Alps by the observation that these valleys occupy synclinals in a series of crust-folds, which runs transversely to the main lines of folding, to which the chain itself is due.

Austria—Bukovina. *B.S.G. Romana* **15**, 1894 (1896): 3–19. **Olinescu.**

Hărțile Bucovinei, memoriu de Dionisie Olinescu.

On the maps of Bukovina.

Austria—Dachstein. *M.G. Ges. Wien* **40** (1897): 23–98. **Groller v. Mildensee.**

Das Karlseisfeld. Von M. Groller v. Mildensee. *With Map.*

Detailed account of the survey of an alpine ice-field.

Austria—Istria. *B.S.G. Romana* **15**, 1894 (1896): 56–77. **Burada.**

Românii din Istria, conferință de T. T. Burada.

On the Rumanian element in Istria.

Austria—Istria. *Mém. A. Dijon* (4) **5**, 1895-96 (1896): 145–163. **Robin.**

Cinq jours de croisière en Istrie. Par le Dr. Albert Robin. *With Illustrations.*

Account of a cruise in the Adriatic on board Mr. Gordon Bennett's yacht.

Austria—Salzburg. **Ebner.**

Das Rauriserthal mit den Denkmälern seiner Geschichte und Kultur. Von P. A. Ebner.—Fünfter Jahres-Bericht des Sonnblick-Vereines für das Jahr 1896. Pp. 11-22. Wien, 1897. Size 11½ × 7½. *Illustrations.*

Austria—Sudetes. *Abrégé B.S. Hongroise G.* **24** (1896): 43–61. **Francé.**

Das Quellgebiet der March. Von Raoul H. Francé.

On the central region of the Sudetic range, in which the river March takes its rise.

Austria—Tyrol. *Aus allen Weltteilen* **28** (1897): 365–372. **Schultheiss.**

Das Deutschtum in Südtirol. Von Dr. Fr. Guntram Schultheiss.

A regretful statement that Germanizing influences are not active in South Tyrol, where the Italian language and Italian sympathies continue amongst the mass of the people.

France. *B.S.G. Commerc. Bordeaux* **20** (1897): 161–174. **Durègne.**

Dunes primitives et forêts antiques de la côte de Gascogne. Par E. Durègne. *With Map.*

The object of this paper is to show that at the commencement of the contemporary geological period the coast between the Gironde and the Adour was occupied by moving sand-dunes, which, since the commencement of the historic period, have been fixed by the growth of forests.

France—Dijon. *Mém. A. Dijon* **(4) 5** (1895–96) (1896): 165–269. **Picard.**

Le commerce du bois de chauffage et du charbon de bois à Dijon au XVIII^e^ siècle. Par M. E. Picard.

France—Normandy. *Rev. G.* **40** (1897): 161–172. **Filon.**

Le Cap Antifer et la carte d'état-major. Par J. Filon. *With Maps.*

The Staff map and the official French chart differ in the point to which the name "Cap Antifer" is assigned. The author discusses these differences, urges the importance of a combined map and chart to do justice to the delineation of the coast, and gives a short account of the district near Cape Antifer, in Normandy.

Germany—Houses. *Globus* **71** (1897): 169–176, 183–188, 206–214. **Rhamm.**

Der heutige Stand der deutschen Hausforschung und das neueste Werk Meitzens. Von Karl Rhamm.

The scientific study of domestic architecture is carried out very fully in Germany, and this series of papers summarizes the great work of Meitzens on the subject, with references to the plan of dwelling-houses in other countries.

Germany—Pommerania. *Aus Allen Weltteilen* **28** (1897): 343–349, 379–388. **Tetzner.**

In der Kaschubei. Von Dr. F. Tetzner.

Notes of the survivors, now not exceeding two hundred, of the ancient Kaschubi people who live on the south bank of the Leba lake in Pommerania.

Greece *Forhand. Vidensk.-Selsk. Christiania* (1895) (1896): 1–48. **Schjøtt.**

De ethnographiske forhold i det forhistoriske Grækenland. Af P. O. Schjøtt.

On the ethnographic conditions of prehistoric Greece.

Greece. *G.Z.* **3** (1897): 185–228. **Philippson.**

Griechenland und seine Stellung im Orient. Von Dr. Alfred Philippson. *With Map.*

No one is better qualified than Dr. Philippson to describe the physical features of Greece, as he does briefly in this article which also discusses the Greek frontier, the character and economic position of the Greeks, a glance over Greek history, an account of the present state of the country and of the Greeks living in neighbouring countries.

Hungary—Cartography. *Abrégé B. S. Hongroise G.* **24** (1896): 82–97. **Márki.**

Die ungarische Kartographie von einst und jetzt. Von Dr. Alexander Márki.

The first attempts to survey parts of Hungary geographically are traced back to A.D. 89 under the Emperor Domitian.

Hungary—Fiume. *L'Universo* **7** (1897): 83–87, 106-108. **Annoni.**

Fiume e suoi dentorni. Di Antonio Annoni. *With Illustrations.*

Hungary—Lake Balaton. **Cholnoky.**

Resultate der wissenschaftlichen Erforschung des Plattensees. Herausgegeben von der Plattensee-Commission der Ung. Geographischen Gesellschaft. Erster Band. Physikalische Geographie des Plattensees und seiner Umgebung. Dritter Teil. Limnologie des Plattensees. Von Eugen v. Cholnoky. Wien: E. Hölzel, 1897. Size 11½ ×8½, pp. 120. *Plate and Illustrations.*

This will be referred to elsewhere.

Hungary—Lake Balaton. *Abrégé B.S. Hongroise G.* **24** (1896): 76–82. **Lóczy.**

Bericht über die wissenschaftliche Erforschung des Balatonsees. Von Ludwig von Lóczy.

A short account of the work of the Lake Balaton Committee.

Iceland. **Thoroddsen.**

Th. Thoroddsen. Geschichte der Isländischen Geographie. Autorisierte Übersetzung von August Gebhardt. Erster Band: Die Isländische Geographie bis zum Schlusse des 16. Jahrhunderts. Leipzig: B. G. Teubner, 1897. Size 10 × 7, pp. xvi. and 238.

A very careful translation from Thoroddsen's important Icelandic work on the history of Iceland.

Italy. *Atti R.A. Lincei* (1897) (5) *Rendiconti* **6**: 199-201. **Tacchini.**

Sull' insolazione al nord, al centro ed al sud d'Italia. Nota del Socio P. Tacchini.

On insolation in Italy. A table is given of the average insolation for each ten-day period for Turin, Padua, Aquila, Rome, Lecce, and Palermo.

Italy—Lago d'Orta. **Agostini.**

G. de Agostini. Il lago d'Orta. Torino: C. Clausen, 1897. Size 13 × 9½, pp. 40. *Maps and Profiles. Presented by the Author.*

A special note will be devoted to this fine piece of work.

Italy—Sicily. *C. Rd.* **124** (1897): 797–800. **Faye.**

Sur l'observatoire de l'Etna, d'après les observations de M. Riccò. Note de M. H. Faye.

The observatory on Mount Etna was established in 1891 for astronomical and meteorological observations, at an elevation of 9650 feet above the sea. The mean annual temperature was about 33° Fahr.; for summer, 45°; and for winter, 20°.

Mediterranean—Crete. *Fortnightly Rev.* **61** (1897): 782–810. **Dillon.**

Crete and the Cretans. By Dr. E. J. Dillon.

Mediterranean—Crete. *Aus allen Weltteilen* **28** (1897): 373–380. **Canstatt.**

Kreta. Von Koloniedirektor O. Canstatt. *With Map and Illustration.*

Mediterranean—Malta. **Mizzi.**

A Voice from Malta. By M. A. M. Mizzi. 1896. Malta: printed at the *Daily Malta Chronicle* Office. Size 7 × 5, pp. xii. and 60. *Price* 1*s.* 6*d. Presented by the Author.*

Discusses chiefly the language of Malta, with notes on the islands and a bibliography.

Norway. ———

Norway Pilot. Part i. From the Naze to Christiania; thence to the Kattegat. Third Edition. London: J. D. Potter, 1897. Size 9½ × 6, pp. xxvi. and 492. *Index Chart. Price* 4*s. Presented by the Hydrographer of the Admiralty.*

Norway—Earthquakes. *Forhand. Vidensk. S. Christiania* 1895 (1896): 1–79. **Reusch.**

Jordskjælv i Norge. Tre afhandlinger. Af Hans Reusch. Med "An English Summary of the Contents."

Norway—Fisheries. *Skrifter Vidensk. Christiania*, 1895 (1896): 1–76, 1–78. **Hjort.**

Hydrographic-biological Studies of the Norwegian Fisheries. By Dr. Johan Hjort. *With* 15 *Plates and Charts.* Tables of the Hydrographical Investigations.

This will be noticed in the Monthly Record.

Norway—Kongsberg. *Skrifter Vidensk. Christiania*, 1894 (1895): 1–104. **Munster.**

Kongsbergs ertsdistrikt. 1. Grubefeltets geologi. 2. Fahlbaand og fahler. 3. Gangformationerne. 4. Erfaringer om sølvets optræden. 5. Kalkspathgangene og sølvets genesis. Af Chr. A. Münster.

On the Kongsberg Ore district, in the south of Norway.

Norway—Lofotens. *Globus* **71** (1897): 201–204. **Blomberg.**

Beim Kabeljaufang auf den Lofoten. Von H. Blomberg. *With Illustrations.*

On the cod-fisheries of Northern Norway.

Norway—Stavanger. *Skrifter Vidensk. Christiania*, 1895 (1896): 1–72. **Arbo.**

Fortsatte Bidrag til Nordmændenes Anthropologi. III. Stavanger Amt. Af C. O. E. Arbo. *With Diagrams.*

Russia. *Contemporary Rev.* **71** (1897): 711–733. **Durban.**

Russia as it is. By W. Durban.

The position of Russia as a modern nation, with regard to its people, culture, and political position.

Russia. **Krichtafovitch.**

Annuaire Géologique et Minéralogique de la Russie, rédigé par N. Krichtafovitch. Vol. i. livr. 2 (première moitié). Varsovie, 1897. Size 12½ × 9.

Russia. *Imp. and Asiatic Quarterly Rev.* **3** (1897): 294–308. **Parker.**

Modern Russia and Asiatic Traditions. By E. H. Parker.

Russia—Baltic Coast. *Fennia* **12** (1896): 1–16. **Bonsdorff.**

Die saeculare Hebung der Küste bei Reval, Libau und Ust-Dwinsk (Dünamünde). Von Axel Bonsdorff.

Russia—Finland. *Fennia* **12** (1896): 1–17. **Herlin.**

Tavastmons erosionsterrasser och strandlinjer. Af Rafael Herlin. *With Map and Plate.* [With Abstract. Erosionsterrassen und Strandlinien am ås Tavastmon.]

Russia—Finland. *Fennia* **12** (1896): 1–43. **Kihlman.**

Nattfrosterna i Finland 1894. Af A. Osw. Kihlman. *With Maps.*

On the night-frosts in Finland during 1894, with an abstract in German.

Russia—Finland. *Fennia* **12** (1896): 1–44. **Ramsay, etc.**

Till frågan om det senglaciala halvets utbredning i södra Finland. Af Wilhelm Ramsay. *With Map.*

Bihang 1. Marina gränser i östra Finland, bestämda af V. Hackman.

Bihang 2. Några iakttagelser rörande Yoldiahafvets högsta strandlinier. Af J. J. Sederholm.

Bihang 3. Résumé: La trangression de l'ancienne mer glaciaire (la mer de Yoldia) sur la Finlande méridionale.

Russia—Finland. *Fennia* **12** (1896): 1–32. **Sederholm.**

Några ord om södra Finlands prekvartära geologi. Svar till Professor F. J. Wiik. Af J. J. Sederholm. [With Abstract. Einige Worte über die praequartäre Geologie des südlichen Finnlands. Antwort an Herrn Professor F. J. Wiik.]

Russia—Finland. *Fennia* **12** (1896): 1–22. **Wahlroos.**

Bidrag till Kännedom om hafsstrandens förskjutning vid en del af Finlands vestkust. Af Achilles Wahlroos. *With Map.* [With Abstract. Verschiebung der Strandlinie an der Westküste Finnlands.]

Russia—Finland. *Fennia* **12** (1896): 1–30. **Wiik.**

Om södra Finlands primitiva formationer [With Abstract. Über die primitiven Formationen Süd-Finnlands. Von F. J. Wiik.]

Russia—Geology. **Nikitin.**

Bibliothèque Géologique de la Russie. 1895. Composée sous la rédaction de S. Nikitin. Supplément au T. xv. des Bulletins du Comité Géologique. St. Petersburg: Eggers & Co., 1896. Size 10 × 7, pp. 224. *Presented by the Geological Committee of the Imperial Russian Geographical Society.*

Sweden. *Ymer* **17** (1897): 41–76. **Andersson.**

Den Centralsjämtska issjön. Af Gunnar Andersson. *With Maps and Illustrations.*

On the glacial lake, and the glacial geology, of Central Jämtland, in Sweden, with three maps showing the successive positions of the ice-cap.

Switzerland.

Statistique de la Suisse—107e Livraison. Résultats de la Statistique Suisse des Incendies du 1er janvier 1893 au 31 décembre 1894. Publié par le Bureau de Statistique du Département fédéral de l'intérieur. Berne, 1896. Size 11 × 9, pp. 56 and 72.

Switzerland. **Graf.**

Bibliographie der Schweizerischen Landeskunde. Fascikel IId. Generalregister. Ergänzungen und Nachträge zu den Fascikeln II. a—c, enthaltend Landesvermessung, Kataloge der Kartensammlungen, Karten, Pläne, Reliefs und Panoramen, Herausgegeben vom Eidgenössischen Topographischen Büreau. Redigirt von Professor Dr. J. H. Graf. Bern: K. J. Wyss, 1896. Size 9 × 6, pp. [220] and xxvi.

Switzerland—Statistics. ———

Atlas graphique et statistique de la Suisse. Publié par le Bureau de Statistique du Département Fédéral de l'Intérieur. 1897. Bern: Stämpfli & Cie. Size 10 × 7, pp. xxvi. and 96. *Maps and Plates.*

All the statistics of Switzerland are here presented in a graphic form, assisted by the skilful use of colour. They are given as maps, curves, and diagrams, according to the special appropriateness for each case.

Switzerland—Statistics. ———

Annuire Statistique de la Suisse. Publié par le Bureau de Statistique du Département Fédéral de l'Intérieur. Sixième Année. 1896. Bern, 1897. Size 9½ × 6½, pp. 328.

Switzerland—Valais. *M. Antiquar. Ges. Zürich* **24** (1896): 97–180. **Heierli and Oechsli.**

Urgeschichte des Wallis. Von J. Heierli und W. Oechsli. *With Map and Plates.*

An elaborate discussion of the pre-history of Valais, derived from antiquities, and treated under the heads of the Stone, Bronze, and Iron ages, with later references to the earliest historical accounts.

United Kingdom. **Geikie.**

The Ancient Volcanoes of Great Britain. By Sir Archibald Geikie, F.R.S. 2 vols. London: Macmillan & Co., 1897. Size 10½ × 7, pp. (vol. i.) xxiv. and 478; (vol. ii.) xvi. and 492. *Maps and Illustrations. Price* 36*s. Presented by the Publishers.*

A detailed notice of this important work will be given in the Monthly Record.

United Kingdom. *Rep. British Assoc.* (1896): 357–365. **Watts.**

Photographs of Geological Interest in the United Kingdom. Seventh Report of the Committee. Drawn up by Mr. W. W. Watts.

The collection of geological photographs now numbers 1412, and is being arranged in the Geological Museum in Jermyn Street. It is a matter of no small importance to secure good pictures of geological sections and structures which are often exposed only for a short time.

United Kingdom—England and Wales. *J. R. Statistical S.* **60** (1897): 33–83. **Welton.**

Local Death-Rates in England and Wales in the Ten Years 1881–90. By Thomas A. Welton. *With Diagrams.*

United Kingdom—England—Mersey. *Rep. British Assoc.* (1896): 548–568. **Lyster.**

On the Physical and Engineering Features of the River Mersey and Port of Liverpool. By George Fosbery Lyster.

United Kingdom—England—Winchester. **Maxwell.**

Blackwood's Mag. **161** (1897): 485–499.

A City of many Waters. By Sir Herbert Maxwell, M.P.

A picturesque description of Winchester and the river Itchin, including an outline of the history and antiquities of the town.

United Kingdom—Ethnographical Survey. **Brabrook.**

Rep. British Assoc. (1896): 607–656.

Ethnographical Survey of the United Kingdom.—Fourth Report of the Committee. Drawn up by Mr. E. W. Brabrook.

This report contains four papers—the Ethnographical Survey of Ireland, by the committee; the Ethnographical Survey of Pembroke, by Mr. E. Laws; Preliminary Report on Folklore in Galloway, by Dr. W. Gregor; and on the method of determining the value of Folklore as ethnological data, by Mr. G. L. Gomme.

ASIA.

Arabia—Petra. *T. Liverpool G.S.* (1896): 53–74. **Hill.**

A Journey to Petra—1896. By Gray Hill.

Asia-Minor. *Le Globe* **36**, 1896–1897 (1897): 31–43. **Martin.**

Souvenirs de quelques années passées en Asie Mineure. Par M. William Martin.

The descriptions here given of peoples, towns, and public works in Asia-Minor are the result of eight years' observation, while the author was assisting as an engineer in the construction of the Anatolian railway.

Ceylon. *Scottish G. Mag.* **13** (1897): 169–188. **Clarence.**

Ceylon. By L. B. Clarence.

China. *A travers le Monde, Tour du Monde* **3** (1897): 97–100. ——

Mission Lyonnaise d'Exploration commerciale en Chine. Le Se-Tchouen—Souï-Fou—Le Yang-Tsé—Kiating-Fou. *With Illustrations.*

China—Confucius. *Imp. and Asiatic Quarterly Rev.* **3** (1897): 387–412. **Parker.**

A plain account of the Life, Labours, and Doctrines of Confucius. By E. H. Parker. *With Map, Specimen of Confucius' Handwriting, and Eight Pictures from a rare Chinese book (the latter supplied by Dr. Leitner).*

Chinese Empire—Tibet. *T. Liverpool G.S.* (1896): 74–92. **Fletcher.**

A Journey toward Llassa. By W. A. L. Fletcher.

Mr. Fletcher accompanied Mr. and Mrs. Littledale on their last journey across Tibet.

Dutch East Indies—Historical. **Bisschop.**

Bijd. Taal-, Land-, en Volkenk. Ned.-Indië (6) **3** (1897): 183–209.

Onderzoek van stukken in het India office. Verslag van Mr. W. Roosegaarde Bisschop.

An account of the material in the India Office, London, bearing on the history of the Dutch in the East Indies.

India—Anthropology. **Thurston.**

Madras Government Museum. Bulletin, vol. ii. No. 1. Anthropology. Badagas and Irulas of the Nilgiris; Paniyans of Malabar; A Cheruman Skull; A Chinese-Tamil Cross; Kuruba or Kurumba; Summary of Results. With Seventeen Plates. By Edgar Thurston, Madras, 1897. Size 9 × 5½, pp. 68. *Presented by the Author.*

India—Baluchistan. **Maynard and Prain.**

Records of the Botanical Survey of India. Vol. i. No. 8. A Note on the Botany of the Baluch-Afghan Boundary Commission, 1896. By F. P. Maynard and D. Prain. Calcutta, 1896. Size 10 × 6½, pp. [14]. *Map.*

India—Burma. *Blackwood's Mag.* **161** (1897): 536–544. **Fielding.**

How the Famine came to Burma. By H. Fielding.

A description of the causes which led to the famine in Upper Burma last winter, and the way in which the scarcity was faced by the people.

India—Forestry. *Imp. and Asiatic Quarterly Rev.* (3) **3** (1897): 245–257. **Brandis.**

Indian Forestry. The extended employment of Natives. By Sir Dietrich Brandis, K.C.I.E., etc.

India—Madras. ——

Report on the Administration of the Madras Presidency, during the year 1895–96. Madras, 1896. Size 13½ × 8½, pp. xvi., 40, 216, and ccxviii. *Diagrams. Presented by the Secretary of State for India.*

Indian Ocean. ——

Straits Settlements. Papers relating to the Cocos-Keeling and Christmas Islands. London: Eyre & Spottiswoode, 1897. Size 13½ × 8½, pp. iv. and 90. *Map. Price* 1*s.*

A note on this Report will be given in the Monthly Record.

Malay Archipelago—Sumatra. **Van der Kemp.**

Bijd. Taal-, Land-, en Volkenk. Ned.-Indië (6) **3** (1897): 210–223.

De Zendingen van Ibbetson en Anderson naar Sumatra's Oostkust in 1820 en 1823. Door P. H. van der Kemp.

A description of the mission of Ibbetson and Anderson to Sumatra in 1820 on behalf of the East India Company, with long quotations from the English records in the India Office.

Palestine. *M.G. Ges. Wien* **40** (1897): 1–22. **Diener.**

Die Katastrophe von Sodom und Gomorrha in Lichte geologischer Forschung. Von Dr. C. Diener.

A discussion of the natural phenomena which may account for the scriptural description of the destruction of the cities of the plain.

Siberia. *Blackwood's Mag.* **161** (1897): 500–513, 653–667. **Simpson.**

The Prisons of Siberia. I. On the March. By J. Y. Simpson.

An account of a recent visit to the forwarding prisons of Siberia.

Siberian Railway. *Rev. Française* **22** (1897): 231–238. **Vasco.**

Le Transsibérien et le Transmandchourien. Par G. Vasco. *With Map.*

Siberia—Railway. *National G. Mag.* **8** (1897): 121–124. **Greely.**

The Siberian Transcontinental Railway. By General A. W. Greely.

Notes on the Trans-Siberian railway from information supplied by U.S. diplomatic and consular officers.

Siberia—Sakhalin. *Fortnightly Rev.* **61** (1897): 711–715. **De Windt.**

The Island of Sakhalin. By Harry de Windt.

AFRICA.

British East Africa—Zanzibar. **Baumann.**

Wissenschaftliche Veröffentlichungen des Vereins für Erdkunde zu Leipzig. Dritter Band, Zweites Heft. Die Insel Sansibar. Von Dr. Oscar Baumann. Leipzig: Duncker & Humblot, 1897. Size 10 × 6½, pp. 48. *Map and Plan.*

This will be specially noticed.

British South Africa. *J.S. Arts* **45** (1897): 515–531. **Fripp.**

Recent Travels in Rhodesia and British Bechuanaland. By C. E. Fripp.

British West Africa. **Harford-Battersby.**

Imp. and Asiatic Quarterly Rev. (3) **3** (1897): 309–319.

Bida and Benin. By C. F. Harford-Battersby, M.A., M.D.

Egypt. *A travers le Monde, Tour du Monde* **3** (1897): 129–132. **Gayet.**

Une Visite à la Vallée du Bir-el-Aïn Haute-Égypte. Par M. A. Gayet. *With Illustrations.*

Egypt. *Globus* **71** (1897): 233–240. **Goldziher.**

Aus dem mohammedanischen Heiligenkultus in Ägypten. Von Ignaz Goldziher.

Egypt. *Z. Ges. Erdk. Berlin* **32** (1897): 1–22. **Schweinfurth.**

Die Steinbrüche am Mons Claudianus in der östlichen Wüste Ägyptens. Von G. Schweinfurth. *With Map and Plate.*

Egypt—Nile Delta. *P.R.S.* **61** (1897): 32–40. **Judd.**

Second Report on a Series of Specimens of the Deposits of the Nile Delta, obtained by Boring Operations undertaken by the Royal Society. By John W. Judd, C.B., etc.

This will be the subject of a note.

French West Africa—Niger. ———

B. Comité d'Afrique Française **7** (1897): 107–112.

Les missions françaises dans la boucle du Niger: Dans le Mossi.—La mission Baud. —La mission Bretonnet. *With Map.*

Madagascar. *P. Zoolog. S.*, 1896 (1897): 971–981. **Major.**

On the General Results of a Zoological Expedition to Madagascar in 1894–96. By C. J. Forsyth Major.

Dr. Forsyth Major reached Madagascar in August, 1894, and left in July, 1896. Most of the time was spent in the Tanala forest, staying at Ivohimanitra, Ambohimitombo, Ambositra, Sirabé, Ampitambé. The time, save for interruptions due to the political condition of the country, was spent in the diligent collection of zoological specimens. An extended series of excavations in the marshes of Sirabe brought to light a better collection of Æpyornis remains than had previously been obtained.

Sudan. *M.V. Erdk. Leipzig*, 1896 (1897): 1–79. **Müller.**
Die Staatenbildungen des oberen Uëlle- und Zwischenseen-Gebietes. Ein Beitrag zur politischen Geographie. Von Dr. Phil. Curt Müller. *With Map.*

On the organization of the native nationalities in the upper Welle region and the region between the great African lakes.

West Africa. *T. Liverpool G.S.* (1896): 36–52. **Kingsley.**
The Ascent of Cameroons Peak, and Travels in French Congo. By Miss M. H. Kingsley.

West Africa—Benin. *T. Liverpool G.S.* (1896): 94–101. **Ogilby—Irvine.**
Description of the Kingdon of Benin, written about the year 1630, and abridged from the folio edition of John Ogilby, published in 1670. By James Irvine. *With Plate.*

West Africa—Niger. *Rev. Française* **22** (1897): 208–218. ———
Niger: Les Français à Boussa. *With Map.*

NORTH AMERICA.

Canada. *Nautical Mag.* **66** (1897): 330–334. **Gilbert.**
Canada's Proposed New Front Door. By Robert Jarvis Gilbert. *With Map.*
On the proposed Hudson bay route to Western Canada.

Canada—Geology. **Adams.**
Geological Survey of Canada, G. M. Dawson, C.M.G., etc., Director. Part J, Annual Report, vol. viii. Report on the Geology of a portion of the Laurentian Area lying to the north of the Island of Montreal. By Frank D. Adams, PH.D. Ottawa, 1896. Size 10 × 7, pp. 184. *Map and Plates. Presented by the Geological Survey of Canada.*

Canada—Hudson's Bay and Pacific Railway. **Harris.**
Direct Route through the North-West Territories of Canada to the Pacific Ocean. The Chartered Hudson's Bay and Pacific Railway Route. (With a map.) By Colonel Josiah Harris. London: Spottiswoode & Co., 1897. Size 9½ × 6½, pp. 66. *Presented by the Author.*

The author's desire is "to silence the unsupported and mischievous impressions that Hudson's straits and bay are rendered useless by ice for commercial purposes," and "to bring forward indubitable evidence to prove that the straits are open for navigation during a longer period even than the Gulf of St. Lawrence."

Canada—North-West Tribes. *Rep. British Assoc.* (1896): 569–591. ———
The North-Western Tribes of Canada. Eleventh Report of the Committee.

Canada—Nova Scotia. *P. and T. Nova Scotian I. Sci.* **9** (1896): 180–194. **Bailey.**
Some Nova Scotian Illustrations of Dynamical Geology. By Prof. L. W. Bailey, PH.D., etc. *With Three Plates.*

Canada—Nova Scotia. *P. and T. Nova Scotian I. Sci.* **9** (1896): 134–149. **Gilpin.**
The Undeveloped Coal Fields of Nova Scotia. By E. Gilpin, Jr., LL.D., etc.

Lake Superior. *National G. Mag.* **8** (1897): 111–120. **Harrington.**
Area and Drainage Basin of Lake Superior. By Dr. Mark W. Harrington.

United States—Wisconsin. *J. Geology* **5** (1897): 131–147. **Salisbury and Atwood.**
Drift Phenomena in the Vicinity of Devil's Lake and Baraboo, Wisconsin. By Rollin D. Salisbury and Wallace Walter Atwood. *With Maps, etc.*

A summary of the results of practical work by the students of Chicago University in the Field Geology class.

CENTRAL AND SOUTH AMERICA.

Argentine. *Aus allen Welttheilen* **28** (1897): 337–344. **Semler.**
Die Zukunft des Deutschtums in Argentinien. Von Franz Semler.

Propounds a scheme for the economic conquest of the Argentine Republic, by concentrating the divergent stream of German emigration towards that country, for which —though not for its present government—the author foresees a great future.

Brazil. *Verh. Ges. Erdk. Berlin* **24** (1897): 172–198. **Meyer.**

Herr Dr. Herrmann Meyer: Über seine Expedition nach Central-Brasilien. *With Map.*

This journey will be specially noticed. A note on the journey appears in the April *Journal*, p. 447.

Chili and Argentine. *Z. Ges. Erdk. Berlin* **32** (1897): 23–64. **Steffen.**

Die chilenisch-argentinische Grenzfrage mit besonderer Berücksichtigung Patagoniens. Von Dr. Hans Steffen. *With Map.*

Also a separate copy. *Presented by the Author.*

Cuba. **Amabile.**

La Question Cubaine et le Conflit Hispano-Américain, Conférence . . . par V. Mestre Amabile. Paris, 1896. Size 10 × 7, pp. 126. *Portraits and Maps. Presented by the Author.*

Guatemala. *Globus* **71** (1897): 188–191. **Sapper.**

Die Volksdichtigkeit der Republik Guatemala. Von Dr. Karl Sapper. *With Map.*

An estimate of the distribution of population in the republic of Guatemala, with a map of the density of population.

Jamaica—Cartography. **Cundall.**

Jamaica Cartography. Chronological List of the Maps of Jamaica in the Library of the Institute of Jamaica, both on separate sheets and in books, with some Notes on the History of the Parishes of the Island. By Frank Cundall, F.S.A. Reprinted from 'The Handbook of Jamaica for 1897.' Kingston, Jamaica. Size 8½ × 6, pp. 16. *Presented by the Author.*

The list of maps is accompanied by an account of the origin of some of the modern place-names in Jamaica.

Paraguay. **Santos.**

La República del Paraguay. Por Carlos R. Santos. Asunción: H. Kraus, 1897. Size 7 × 5½, pp. viii. and 146. *Presented by Mr. Christopher James, Consul-General for Paraguay.*

Peru. ———

Memorandum sobre el proyecto de Ferrocarril de la Oroya al Paucartambo que el Presidente de la Sociedad Geografica de Lima, presenta al Gobierno. Lima, 1897. Size 12½ × 8½, pp. 14.

Peru. *B.S.G. Lima* **6** (1896): 16–43. ———

Itinerario de los viajes de Raimondi en el Perú. De Lima á Morococha.

South America. *Scottish G. Mag.* **13** (1897): 189–200. **Vincent.**

The British in South America. By Col. Sir Howard Vincent, C.B., M.P.

AUSTRALASIA AND PACIFIC ISLANDS.

Australasia. **Thomson.**

Geography in Australasia. Anniversary Address to the Royal Geographical Society of Australasia, Brisbane, by the President, J. P. Thomson. Delivered at the Anniversary Meeting of the Society, July 22, 1896. Size 9 × 6, pp. 22.

Australia. ———

The Australian Mining Standard. Special West Australian and N.S.W. Edition. Sydney and Melbourne, August, 1896. Size 15½ × 10½, pp. [42]. *Illustrations. Price* 6*d*. *Presented by the Publishers.*

Navigation ———

The Australia Directory. Volume i. South and East Coasts from Cape Leeuwin to Port Jackson, including Bass Strait and Tasmania. Originally compiled by Captain Charles B. Yule, R.N. Ninth Edition. London: J. D. Potter, 1897. Size 9½ × 6½, pp. xxii. and 900. *Index Chart. Price* 5*s*. *Presented by the Hydrographer of the Admiralty.*

New Caledonia. *B. Union G. Nord de la France* **17** (1896): 125–135. **Dubois.**

La Nouvelle Calédonie. Par M. Marcel Dubois.

An appreciation of the value to France of this colony.

New South Wales—Broken Hill. ———

The Silver Sulphides of Broken Hill. Special Edition of the Australian Mining Standard, January 20, 1897. Sydney and Melbourne. Size 15½ × 10½, pp. 32. *Illustrations. Price* 1*s. Presented by the Publishers.*

POLAR REGIONS.

Arctic—Davis' and Baffin's Bay. *American J. Science* (4) **3** (1897): 315–320. **Tarr.**

Difference in the climate of the Greenland and American sides of Davis' and Baffin's Bay. By Ralph S. Tarr.

Greenland. *Ymer* **17** (1897): 21–39. **Andersen.**

En Sommerrejse i Diskobugten og Umanakfjorden. Af Astrid Andersen.

A summer voyage to Disco Bay and the Umanakfiord in 1893.

Greenland. *National G. Mag.* **8** (1897): 97–110. **Putnam.**

A Summer Voyage to the Arctic. By G. R. Putnam. *With Map and Illustrations.*

Notes on a visit to the Umanak fjord in the summer of 1896.

Spitsbergen. **Conway.**

The First Crossing of Spitsbergen, being an account of an inland journey of exploration and survey, with descriptions of several Mountain Ascents, of Boat Expeditions in Ice Fjord, of a Voyage to North-East-Land, the Seven Islands, down Hinloopen Strait, nearly to Wiches Land, and into most of the Fjords of Spitsbergen, and of an almost complete circumnavigation of the main island. By Sir William Martin Conway. With contributions by J. W. Gregory, D.SC., A. Trevor-Battye, and E. J. Garwood. London: J. M. Dent & Co., 1897: Size 10 × 7, pp. xii. and 372. *Maps and Illustrations. Price* 30*s. Presented by the Author.*

This work will be noticed separately.

Spitsbergen. *Ymer* **17** (1897): 13–16. **Strindberg.**

Karth öfver Amsterdamön med omgifningar. Af Nils Strindberg. *With Maps.*

On the map of Amsterdam Island, on the coast of Spitsbergen.

MATHEMATICAL GEOGRAPHY.

Decimal Angles. *B.S.G. de l'Est* (1896): 236–251. **Barbier.**

Géographie mathématique: De la nécessité de partager les feuilles de la carte du Monde au 1/1,000,000e (projet Penck), en sections décimales de la circonférence et, spécialement, de préférence, par zones de 4° 30′ de latitude en hauteur correspondant à 5 grades. 2e Rapport présenté au Congrès de Lorient. Par M. J. V.-Barbier.

Earth Rotation influences. *Meteorolog. Z.* **14** (1897): 81–91. **Sprung.**

Die vertikale komponente der ablenkenden Kraft der Erdrotation und ihre bewegenden Wirkungen. Von A. Sprung.

Geodesy. **Weiss and Schram.**

Publicationen für die Internationale Erdmessung. Astronomische Arbeiten des K. K. Gradmessungs-Bureau ausgeführt unter der Leitung des Hofrathes Theodor v. Oppolzer. Nach dessen Tode herausgegeben von Prof. Dr. Edmund Weiss und Dr. Robert Schram. VIII. Band. Breiten-, Azimut-, und Winkelbestim-mungen. Wien: J. Tempsky, 1896. Size 12½ × 9½, pp. 212.

Nautical Almanac. ———

The American Ephemeris and Nautical Almanac for the year 1899. Washington: Bureau of Equipment, 1896. Size 11 × 7½, pp. 538. *Diagrams.*

Time. *Rev. Scientifique* (4) **7** (1897): 419–425. **Lallemand.**

L'unification internationale des heures et le système des fuseaux horaires. Par M. Ch. Lallemand.

A clear and logical statement of the reasons why France should concur in the system of hour-zones now accepted by almost all other countries in Europe, by Japan, Australia, and North America. It has been already proposed in the French parliament, "That the legal time in France and Algeria shall be the mean time of Paris retarded by 9 minutes 21 seconds."

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Atmosphere. *Rev. Scientifique* (4) 7 (1897): 488–497. **Graffigny.**

Les sondages de la haute atmosphère. Par M. Henri de Graffigny. *With Diagrams.*

Notes on recent ascents of balloons with registering instruments, but without aëronauts. Three of the French ascents reached heights of 45,276, 49,213, and 50,854 feet respectively, the greatest elevation in the atmosphere from which meteorological observations have yet been obtained.

Earth's Crust. *Science* 5 (1897): 321–330. **Le Conte.**

Earth-crust Movements and their Causes. By Joseph Le Conte.

A clear and orderly summary of the classes of Earth-crust movements which have given rise to oceanic and continental forms, mountain ranges, and oscillations of level. A note on the conclusions will be given in the Monthly Record.

Ice Caves. *J. Franklin I.* 143 (1897): 161–178. **Balch.**

Ice Caves and the Causes of Subterranean Ice. By Edwin Swift Balch. *With Illustrations.*

Also separate copy. *Presented by the Author.*

A note will be given in the Monthly Record.

Limnology—Origin of Lakes. **Swerinzew.**

Zur Entstehung der Alpenseen. (Beiträge zur Morphologie der Erdoberfläche.) Eine geologisch-geographische Studie. Von Dr. Phil. L. Swerinzew. St. Petersburg, 1896. Size 9 × 6, pp. 36. *Illustrations.*

This will be referred to elsewhere.

Meteorology. **Fassig.**

U.S. Department of Agriculture, Weather Bureau. Bulletin No. 11—Part iii. Report of the International Meteorological Congress, held at Chicago, Ill., August 21–24, 1893, under the auspices of the Congress Auxiliary of the World's Columbian Exposition. Part iii. Edited by Oliver L. Fassig, Secretary. Washington, 1896. Size 9½ × 6, pp. 585–772. *Plates. Presented by the U.S. Department of Agriculture.*

The reports on questions of geographical interest are separately mentioned.

Meteorology. *National G. Mag.* 8 (1897): 65–82. **Moore.**

Storms and Weather Forecasts. By Professor Willis L. Moore. *With Charts.*

Oceanography. *P. Zoolog. S.* 1896 (1897): 991–996. **Fowler.**

Contributions to our Knowledge of the Plankton of the Faeroe Channel.—No. 1. By G. Herbert Fowler, B.A., PH.D. *With Plate.*

Dr. Fowler was on board H.M.S. *Research*, the physical results obtained by which were noted in a recent number.

Plant Geography. *Forhand. Videnskr.-S. Christiania*, 1894 (1895): 1–44. **Dahl.**

Plantegeografiske undersøgelser i ydre Søndrøre, 1894. Af Ove Dahl.

Seismolog. *Rep. British Assoc.* (1896): 180–230. **Milne.**

Seismological Investigation.—First Report of the Committee. *With Diagrams.*

This report includes three contributions by Prof. Milne, and other contributions by Profs. Turner, Perry, Knott, and Dr. C. Davidson.

Terrestrial Magnetism. **Schmidt.**

Ueber die Nothwendigkeit einer Vervollständigung des Netzes der erdmagnetischen Observatorien. Von Dr. Ad. Schmidt.—Beiträge zur Geophysik. Herausgegeben von Prof. Dr. Georg Gerland. III. Band. 2 Heft. Pp. 225–246. Leipzig: W. Engelmann, 1897. Size 9 × 6.

Terrestrial Magnetism. **Schwerer and Guyou.**

Ann. Hydrographiques (2) (1896): 71–187.

Observations magnétiques en mer à bord du croiseur le *Dubourdieu*. Par M. le lieutenant de vaisseau Schwerer. Méthode de réduction des observations. Par M. le captaine de frégate E. Guyou. *With Plates.*

Tidal Rivers. **Hautreux.**

Amélioration d'une rivière à marée. Par M. Hautreux.—Congrès National des Sociétés Françaises de Géographie. 16e Session. Bordeaux, Août 1895. Compte Rendu. Bordeaux, 1896. Size 10 × 6½, pp. 167–174.

Upper Atmosphere. *C.Rd.* **124** (1897): 486–488. **Cailletet.**

Sur les appareils employés pour recueillir l'air à grande hauteur, dans l'ascension de l'*Aérophile* du 18 février 1897. Analyse de l'air recueilli. Note de M. L. Cailletet.

Volcanic Action. *P. Boston S. Nat. Hist.* **27** (1896): 89–106. **Shaler.**

Conditions and Effects of the Expulsion of Gases from the Earth. By N. S. Shaler.

Volcanoes. *B.S.G. Rochefort* **18** (1896): 271–274. **Delauney.**

Distribution géographique des volcans: Terre, Lune, Soleil. Par M. Delauney.

A classification of 175 active terrestrial volcanoes in latitude and in longitude, a similar grouping of the craters visible in the moon, and a few remarks on sunspots. The author concludes that the distribution of solar, lunar, and terrestrial volcanoes is "in complete identity from the geographical point of view."

Zoogeography. *Mem. A. Imp. Sci. St.-Pétersbourg* (8) **3** (1895): 1–30. **Büchner.**

Das allmähliche Aussterben des Wisents [*Bison bonasus* (Linn.)] im Forste von Bjelowjesha. Von Eug. Büchner.

On the dying out of the primitive bisons in the forests of Byelovyesha, in Grodno.

Zoogeography. *Globus* **71** (1897): 85–89. **Nehring.**

Einige Bemerkungen über Anton Wieds 'Moscovia' und das zugehörige Urusbild. Von Prof. Dr. A. Nehring. *With Illustrations.*

Zoogeography—Seals. **Grevé.**

Abh. K. Leopoldinisch-Carolin. Deutsch. A. Naturforscher **66** (1896): 287–332.

Die geographische Verbreitung der Pinnipedia. Von Carl Grevé. *With Maps.*

On the distribution of the different genera and species of seals, with four maps, on which the habitat of each species is distinguished.

ANTHROPOGEOGRAPHY AND HISTORICAL GEOGRAPHY.

Historical—Recent Progress. *Knowledge* **20** (1897): 60–63. **Mill.**

The Victorian Era in Geography. By Hugh Robert Mill, D.Sc. *With Maps.*

A sketch of geographical exploration by land during the last sixty years. The maps intended to illustrate the paper were inserted without being submitted to the author, and are not correct.

Historical Maps. *Ric. G. Italiana* **3** (1896): 90–97, 388–399, 520–527. **Errera.**

Atlanti e Carte nautiche dal secolo XIV. al XVII. conservati nelle biblioteche pubbliche e private di Milano. Note di Carlo Errera.

On atlases and marine charts between the fourteenth and seventeenth centuries.

History of Geography. **Beazley.**

The Dawn of Modern Geography. A History of Exploration and Geographical Science from the Conversion of the Roman Empire to A.D. 900, with an Account of the Achievements and Writings of the Early Christian, Arab, and Chinese Travellers and Students. By C. Raymond Beazley. With reproductions of the principal Maps of the time. London: John Murray, 1897. Size 9 × 6, pp. xvi. and 538. *Price* 18*s*. *Presented by the Publisher.*

The scope of this history, which was reviewed in the May *Journal*, p. 532, is the period between A.D. 300 and 900, and is mainly confined to the Christian writings of that period, the Arabic and Chinese works being referred to at much less length.

BIOGRAPHY.

Bahnson. *Ymer* **17** (1897): 77–80. **Stolpe**

Kristian Bahnson. Af Hjalmar Stolpe. *With Portrait.*

Biography of a Danish ethnologist who had travelled in Northern Europe and Greenland.

Hakluyt. **Markham.**

Richard Hakluyt: his Life and Work. With a short account of the aims and achievements of the Hakluyt Society. An Address delivered by Sir Clements Markham, K.C.B., F.R.S. (President), on the occasion of the Fiftieth Anniversary of the Foundation of the Society, December 15, 1896. London: 1896. Size 8½ × 5½, pp. 20. *Presented by the Author.*

Pisa. *L'Universo* **7** (1897): 100–106. ——

Viaggiatori italiani. Ugo Pisa.

Wharton. *Nautical Mag.* **66** (1897): 279–281. ——

The Editor's Album: Rear-Admiral Wharton, C.B., F.R.S. Hydrographer to the Admiralty. *With Portrait.*

GENERAL.

Admiralty—Hydrographic Department. *Nautical Mag.* **66** (1897): 316–303. **Lord.**

The Hydrographic Department. By W. B. Lord.

Australian Geographical Society—Queensland. **Muir.**

The Royal Geographical Society of Australasia, Queensland: an Historical Review. By Alexander Muir, J. P., Vice-President. [Read at the Annual General Meeting of the Society, July 17, 1896.] Size 9 × 6, pp. 20.

Bibliography. **Margerie.**

Congrès Géologique International. 5e Session. Washington, 1891.—6e Session. Zürich, 1894. Catalogue des Bibliographies géologiques, rédigé, avec le concours des Membres de la Commission Bibliographique du Congrès. Par Emm. de Margerie. Paris: Gauthier-Villars et Fils, 1896. Size 10 × 6½, pp. xx. and 734. *Presented by the Author.*

This will be specially noticed.

Bibliography. ——

Catalogue des Livres de la Société de Géographie de Genève au 1er Janvier, 1897. Genève: R. Burkhardt, 1897. Size 9½ × 6½, pp. x. and 94.

British Colonies. *J. R. Colonial I.* **28** (1897): 335–368. **Lowe.**

The Dairy Industry in the Colonies. By Samuel Lowe.

Commercial Geography. ——

Special Consular Reports. Money and Prices in Foreign Countries, being a series of Reports upon the currency systems of various nations in their relation to prices of commodities and wages of labor. Vol. xiii.—Part ii. Washington, 1897. Size 9½ × 6. *Presented by the United States Department of State.*

These are supplementary reports received too late for the first part of the publication, which is now practically complete for all countries.

Commercial Geography—Indiarubber. *National G. Mag.* **8** (1897): 83–88. **Greely.**

Rubber Forests of Nicaragua and Sierra Leone. By General A. W. Greely.

Educational—Methods. *Le Globe* **36**, 1896–1897 (1897): 55–62. **Naville.**

Réflexions sur l'enseignement de la géographie, et exposé des principes d'après lesquels on se propose de rédiger de nouveaux éléments de cette science. Mémoire de F.-L.-M. Naville (1826).

A striking appeal made seventy years ago for the unity of geography as an educational subject.

Educational—Methods. **Wethey.**

A Geography Lesson: the Blackboard and Oral teaching. By E. R. Wethey, M.A. Printed by request of the Geographical Association. London: G. Philip & Son, 1896. Size 8½ × 5½, pp. 14. *Illustrations.*

A note will be given on this paper.

Educational—Methods. *J. School Geography* **1** (1897): 2–7. **Davis.**

Home Geography. By William M. Davis.

Educational—Methods. *J. School Geography* **1** (1897): 48–51. **McMurry.**

The Causal Notion in Geography. By F. M. McMurry.

Educational—Methods. *J. School Geography* **1** (1897): 10–14. **Monroe.**

Geographic Instruction in Germany. By Will. S. Monroe.

Geographical Museum. *B.S.G. de l'Est* (1896): 205–216. **Despiques.**

Géographie économique: Le musée industriel et commercial et le musée

géographique de la section meusienne de la Société de géographie de l'Est à Bar-le-Duc. Par Paul Despiques.

A geographical museum has been established at Bar-le-Duc, with sections for local and general geography, and collections of maps, photographs, ethnographic, and commercial objects, etc.

Geographical Speculation. **Scott-Elliot.**

The Story of Atlantis. A geographical, historical, and ethnological sketch. Illustrated by Four Maps of the World's Configuration at different periods. By W. Scott-Elliot. With a Preface by A. P. Sinnett. London: Theosophical Publishing Society, 1896. Size 9½ × 6, pp. xii. and 72. *Presented by* "Z."

An interesting specimen of "paradoxical" speculation, illustrating the great need which still exists for elementary scientific instruction.

Geographical Year-book. **Wagner.**

Geographisches Jahrbuch. XIX. Band, 1896 . . . herausgegeben von Hermann Wagner. Gotha: Justus Perthes, 1897. Size 9 × 6, pp. viii. and 456.

A note on this volume is given in the *Journal* for April, vol. 9, p. 451.

German Colonies. **Meinecke.**

Koloniales Jahrbuch. Beiträge und Mittheilungen aus dem Gebiete der Kolonialwissenschaft und Kolonialpraxis. Herausgegeben von Gustav Meinecke, Neunter Jahrgang. Berlin: Deutscher Kolonial-Verlag, 1897. Size 10 × 6½, pp. 322.

German Colonies. ———

Weissbuch. Siebzehnter Theil. Berlin: Carl Heymanns Verlag, 1897. Size 12½ × 9½, pp. 190.

This number contains the annual reports for the protectorates of Togo, Cameroons, German East Africa, German South-West Africa, and the Marshall Islands for 1896, and the text of various concessions granted in South-West Africa.

Hungarian Geographical Society. *Abrégé B.S. Hongroise G.* **24** (1896): 65–75. **Erödi.**

Coup d'œil sur l'activité de la Société Hongroise de Géographie depuis sa fondation. Par Dr. Béla Erödi.

Museum Catalogue. ———

A Guide to the Fossil Invertebrates and Plants in the Department of Geology and Palæontology in the British Museum (Natural History), Cromwell Road, London, S.W. Printed by order of the Trustees, 1897. Size 8½ × 5½, pp. xvi. and 158. *Illustrations. Price* 1*s. Presented by the Trustees of the British Museum.*

Museum Catalogue. ———

A Guide to the Fossil Reptiles and Fishes in the Department of Geology and Palæontology in the British Museum (Natural History), Cromwell Road, London, S.W. Printed by order of the Trustees, 1896. Size 8½ × 6, pp. xiv. and 130. *Illustrations. Price* 6*d. Presented by the Trustees of the British Museum.*

Museum Catalogue. ———

A Guide to the Fossil Mammals and Birds in the Department of Geology and Palæontology in the British Museum (Natural History), Cromwell Road, London, S.W. Printed by order of the Trustees, 1896. Size 8½ × 5½, pp. xii. and 104. *Illustrations. Price* 6*d. Presented by the Trustees of the British Museum.*

Museum Catalogue. ———

Field Columbian Museum. Publication 14. Report Series. Vol. i. No. 2. Annual Report of the Director to the Board of Trustees for the year 1895–96. Chicago, 1896. Size 10 × 6½, pp. [84].

Navigation. **Moore.**

The New Rules of the Road at Sea, being the Regulations for preventing Collisions at sea, 1897. With explanatory Notes and Observations on the Law relating thereto. By H. Stuart Moore. London: J. D. Potter, 1897. Size 10 × 6½, pp. 84. *Price* 3*s. Presented by the Publishers.*

A clear statement of the new rules of the road at sea, with illustrations drawn from reports of law cases.

Navigation—Dock Book. ———

Additions and Corrections to Dock Book, 1894, to 31st December, 1895. London: J. Potter, 1896. Size 13½ × 8½, pp. 40. *Price* 1*s.* 6*d. Presented by the Hydrographic Office, Admiralty.*

Particulars of all the docks available for ship-repairs in existence at the close of 1895.

Navigation—List of Lights.

The Admiralty List of Lights, 1897. Part i. The British Islands (pp. 218, price 1*s.* 6*d.*); Part ii. Eastern Shores of the North Sea (pp. 188, price 2*s.*); Part iii. Baltic Sea (pp. 204, price 2*s.*); Part iv. Western Coasts of Europe and Africa (from Dunkerque to the Cape of Good Hope), including Azores, Madeira, Canary, Cape Verde Islands, etc. (pp. 144, price 1*s.* 6*d.*); Part v. The Mediterranean, Black, Azov, and Red Seas (pp. 248, price 1*s.* 6*d.*); Part vi. South Africa, East Indies, China, Japan, Australia, Tasmania, and New Zealand (pp. 248, price 2*s.*); Part vii. South America, Western Coast of North America, Pacific Islands, etc. (pp. 92, price 1*s.*); Part viii. Eastern Coasts of North and Central America (from Labrador to the River Amazon), including Bermuda and Islands of the West Indies (pp. 216, price 2*s.* 6*d.*). London: J. D. Potter, 1897. Size 10 × 6½. *Presented by the Hydrographic Office, Admiralty.*

New Cosmogony. *B.S. Languedoc G.* **19** (1896): 142–184, 337–377. **Duponchel.**

Nouvelle théorie cosmogonique. Le vide dans le plein. Par M. A. Duponchel.

North Pacific Ocean. *Science* **5** (1897): 455–457.

Proposed Exploration on the Coasts of the North Pacific Ocean.

A note on this subject was given in the May *Journal*, p. 568.

Orthography. *Ann. G.* **6** (1897): 14–22. **Aïtoff.**

De la transcription des noms géographiques. Par M. D. Aïtoff.

On the transliteration of Russian into Roman letters for the use of French-speakers.

Pacific Cable. *Blackwood's Mag.* **161** (1897): 269–279.

The All-British Trans-Pacific Cable.

Discusses mainly the economic conditions of the proposed cable.

Royal Society—Year-Book.

Year-Book of the Royal Society, 1896–97. No. 1. London: Harrison & Sons, 1897. Size 8½ × 5½, pp. 154. *Price 5s. Presented by the Royal Society.*

This is the first number of a very useful book of reference containing the laws of the Royal Society, a list of the Fellows, exchanges, the year's additions to the Library, the President's annual address, and other matters. This example is one which might profitably be followed by other societies.

Travel. **Madden.**

The Wilderness and its Tenants. A Series of Geographical and other Essays illustrative of Life in a Wild Country. Together with experiences and observations culled from the great book of Nature in many lands. By John Madden. 3 vols. London: Simpkin, Marshall & Co., 1897. Size 9 × 6, pp. (vol. i.) xvi. and 462; (vol. ii.) 566; (vol. iii.) 554. *Frontispiece. Price 42s.*

These volumes contain a world of laborious research in books, and many pleasant reminiscences of travel. Although some of the references are not very critically selected, and the matter is not very scientifically arranged, the whole is animated by a spirit of enthusiastic appreciation for Nature, and the work embodies many interesting geographical facts not previously brought together.

Travels. **Dodge.**

As the Crow Flies. From Corsica to Charing Cross. By Walter Phelps Dodge. New York: G. M. Allen Company, 1893. Size 7½ × 4, pp. 132. *Presented by the Author.*

Light sketches of visits to various European pleasure-resorts.

Underground Water. **Thomson.**

The Alleged Leakage of Artesian Water. Abstract from an Address delivered to the Members of the Royal Geographical Society of Australasia (Queensland), at a Special Meeting, January 17, 1896. By J. P. Thomson, President. Size 9 × 6, pp. 14. *Presented by the Author.*

NEW MAPS.

By J. COLES, *Map Curator*, R.G.S.

EUROPE.

Balkan Peninsula. **Scheda.**

Josef v. Scheda's Generalkarte der Balkan-Halbinsel. Scale 1 : 864,000 or 13·6 stat. miles to 1 inch. Umarbeitung von A. Steinhauser. 13 Blatter. Verlag von Artaria & Co., Wien, 1897.

This is a new edition of Scheda's well-known map of the Balkan peninsula, and is specially suited for reference at the present time. It contains an excellent plan of Constantinople on the scale of 2½ inches to a mile.

England and Wales. **Ordnance Survey.**

Publications issued since April 8, 1897.

1-inch—General Maps:—

ENGLAND AND WALES:—140, 141, 214, 246, revised, engraved in outline, 1*s.* each.

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ENGLAND AND WALES:—**London** (revision), 10 N.E., 11 S.W. **Hampshire** (revision), 10 N.E., 11 N.W., N.E., 12 N.W., S.W., S.E., 15 N.E., S.W., S.E., 16 N.E., S.W., 17 N.W., N.E., 18 N.E., S.W., S.E., 19 S.W., 24 N.W., 25 S.W., 26 N.W., N.E., S.E. **Middlesex** (revision), 21 N.E. **Surrey** (revision), 19 N.E., S.E. **Wiltshire** (revision), 49 S.W. 1*s.* each.

25-inch—Parish Maps:—

ENGLAND AND WALES:—**Durham** (revision), VII. 4, 6, 7; VIII. 14; XIII. 16; XIV. 3; XXV. 14, 15, 16; XXVI. 12, 13, 14, 16; XXVII. 10, 12, 13, 14, 15, 16; XXVIII. 9, 10, 11, 12; XXIX. 9; XXXII. 4, 6, 7, 8; XXXIII. 1, 2, 3, 5; XXXVIII. 4; XXXIX. 1, 2, 3, 4, 12; XL. 1, 9, 3*s.* each. **Essex** (revision), XXIV. 5, 6, 8, 10, 11, 12, 14, 15, 16; XXV. 13, 15, 16; XXXII. 2, 3, 4, 5, 6, 8, 9, 10, 13, 14, 15, 16; XXXIII. 2, 4, 8; XXXIV. 2, 3, 7, 16; XXXV. 1, 2, 3, 6, 9, 11, 12, 13, 14, 15; XXXVI. 9; XLI. 7, 8; XLII. 2, 3, 5, 8; XLIII. 13; XLV. 5, 9, 10, 14, 15, 16; L. 13; LIV. 1, 3, 7, 8, 12, 13, 14, 15, 16; LVII. 14; LIX. 2; LXIII. 1, 5; LXV. 2, 3; LXX. 13, 15; LXXIV. 16; LXXV. 5, 7, 8; LXXVI. 12, 14, 15; LXXVII. 10, 11, 14; LXXVIII. 1, 2, 4; LXXXII. 4, 8; LXXXIII. 2, 11; LXXXIV. 5, 3*s.* each. **Hampshire** (revision), XX. 8, 16; XXXVI. 3; XLVIA. 15; XLVIII. 7; XLIX. 15; L. 1, 16; LII. 4, 8, 15; LIV. 4, 8, 11, 13, 14, 15, 16; LIVA. 2, 3, 6, 7, 8, 11, 12; LV. 9; LXIIA. 4; LXIII. 1, 2, 3, 4; LXIV. 3, 5; LXV. 9, 14; LXVIII. 13, 3*s.* each. **Kent** (revision), III. 13; XII. 3, 8; XVIII. 8; XX. 9, 14; XXVII. 12, 16; XLII. 4, 15, 16; XLIX. 6, 14; LI. 7, 14; LII. 1, 2, 3, 6, 7, 10, 11; LX. 1, 9, 13, 14; LXI. 3, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 3*s.* each. **Middlesex** (revision), XX. 4, 8, 11, 15; XXI. 2, 12; XXIV. 15, 16; XXV. 4, 3*s.* each. **Northumberland** (revision), LIII. 11, 12, 15; LIV. 9, 10, 11, 12, 13, 14, 15, 16; LV. 9, 10, 11, 12, 13, 14, 15, 16; LVI. 14; LX. 7, 8, 13; LXI. 5, 6, 7, 8; LXII. 3; LXIII. 2, 3, 4, 8, 16; LXIV. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16; LXV. 1, 5, 9, 13, 14; LXXII. 1, 3, 6, 8, 12; LXXIII. 6; LXXV. 16; LXXVI. 13; LXXIX. 4; LXXX. 5, 6, 7, 9, 10, 11, 12, 14; LXXXI. 3, 6, 3*s.* each. **Surrey** (revision), V. 5, 10; X. 2, 3; XI. 8; XII. 8; XIV. 16; XV. 6, 7, 8; XX. 8, 14; XXIII. 11, 15; XXXI. 16; XXXII. 9; XXXV. 13, 14, 15, 16; XXXIX. 15; XLI. 13; XLII. 4; XLVI. 1, 2, 3, 4, 5, 6, 8, 9, 3*s.* each. **Sussex** (revision), II. 11; III. 16; IV. 5; XIII. 2; XXI. 3, 4, 7; XXIII. 1, 2, 3, 5, 6, 9, 11, 3*s.* each.

County Indexes. The following county indexes, showing 25-inch divisions only, coloured in parishes, are now published : Bedfordshire, Breconshire, Cardiganshire, Carmarthenshire, Carnarvonshire, Northamptonshire, Pembrokeshire, Radnorshire, price 6*d.* each.

(*E. Stanford, Agent.*)

ASIA.

Java. **Dornseiffen.**

Java op een Schaal van 1 : 950,000 (or 15·1 stat. miles to an inch). Naar de nieuwste bronnen bewerkt onder toezicht van Dr. I. Dornseiffen. Herzien door E. de Geest. Amsterdam. Seyffardt's Boekhandel. 1896. 4 sheets.

Although this map is by no means clearly drawn, it contains a large amount of useful information with regard to administrative divisions, means of communication

and submarine telegraph cables. It contains a plan of Batavia on an enlarged scale, and a description is given of the symbols employed in the map.

Sumatra. **Dornseiffen and Pleyte.**

Soematra, Bangka en de Riouw-Lingga-Archipel. Schaal 1 : 1,000,000 (or 15·8 stat. miles to an inch.) Bewerkt door Dornseiffen, naar de jongste gegevens gewijzigd door C. M. Pleyte Wz^n. Amsterdam: Seyffardt's Boekhandel, 1896. 12 sheets. *Price* 7.50 *francs.*

This is a new edition of this map of Sumatra and the adjacent islands. Accompanying this map is a list of the maps and charts which have been employed by the authors in correcting and revising it.

AFRICA.

Africa. **Service géographique de l'Armée, Paris.**

Carte d'Afrique. Scale 1 : 2,000,000 or 31·5 stat. miles to an inch. Publié par le Service géographique de l'Armée. Révisé et complété en 1896. Sheet No. 39, San Salvador. *Price* 1 *franc.*

Algeria. **Service géographique de l'Armée, Paris.**

Carte d'Algerie. Scale 1 : 50,000 or 1·26 stat. miles to an inch. Sheets: 94, St. Arnaud; 112, Aumale. Dressé, heliogravé et publié par le Service géographique de l'Armée. Paris. *Price* 1.50 *fr. each sheet.*

East Africa. **Brard.**

Das Südufer des Victoria-Nyansa. Von Pater Brard. Scale 1 : 750,000 or 11·8 stat. miles to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang, 1897. Tafel 7. 1897. Gotha: Justus Perthes. *Presented by the Publisher.*

Matabeleland. **Fletcher and Espin.**

Map of Matabeleland. Scale 1 : 506,880 or 8 stat. miles to an inch. Compiled by Fletcher and Espin. Second Edition, 1897. Published by the Goldfields of Matabeleland, Ltd., and Edward Stanford, London.

This is the second edition of a map of Matabeleland which has previously been noticed in the *Geographical Journal*. It contains a considerable amount of new work, and has been corrected and brought up to date.

Niger River. **Hourst.**

Carte provisoire du Cours de Niger entre Tombouctou et Badjibo. Mission Hydrographique du Niger. Membres de la Mission: MM. Hourst, commandant; Baudry, Bluzet, Taburet. R. P. Hacquard, 1896. Scale (approx.) 1 : 4,500,000 or 71 stat. miles to an inch. Société de Geographie de Paris. *Presented by the Société de Geographie de Paris.*

Tunis. **Service géographique de l'Armée, Paris.**

Tunisie. Carte de Reconnaissance. Scale 1 : 200,000 or 3·1 stat. miles to an inch. Dressé, gravé et publié au Service géographique de l'Armée. Sheets xxxvii. Bir Ali. xl. Jenefien [no date]. *Price 70 cents each sheet.*

AMERICA.

Greenland. **Bay**

Geologische Karte des Scoresby-Sundes. Von E. Bay. Scale 1 : 1,500,000 or 23·6 stat. miles to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang, 1897. Tafel 8. 1897. Gotha: Justus Perthes. *Presented by the Publisher.*

Peru. **Raimondi.**

Mapa del Peru. A. Raimondi. Scale 1 : 500,000 or 7·9 stat. miles to an inch. Engraved and printed by Erhard Bros., Paris. Sheets Nos. 21 and 25. [No date.]

These two sheets include the country east and south-east of Lima. An explanation of the symbols employed is given at the foot of each sheet. The map is printed in four colours, and some of the elevations above sea-level are given in metres. More than two-thirds of the sheets of this map have now been published; when complete, it will form the best map of Peru it is possible to compile from the imperfect material at present available.

GENERAL.

Educational. **Pennesi.**

Atlante Scolastico per la Geografia Fisica e Politica di Giuseppe Pennesi. Istituto Cartografico Italiano. Roma. *Price li* 7.50. [No date.]

This is a new edition of an atlas by the same author which was published in 1894–95 in two parts. Some alterations and additions have been made which have added to the value of the atlas, and the manner in which the political and physical maps have been arranged is worthy of special commendation. The maps are all nicely drawn, and are well suited for educational purposes.

German Colonies. **Langhans.**

Deutscher Kolonial-Atlas, 30 Karten mit 300 Nebenkarten, entworfen, bearbeitet und herausgegeben von Paul Langhans. Erschient in 15 Lieferungen (jede mit 2 Karten). Parts 11 and 12. Gotha: Justus Perthes, 1897. *Price* 1 *mk.* 60 *pf. each part.*

Part 11 contains No. 6, the first of a set of maps showing German colonization in the East, and No. 12 is sheet 2 of a four-sheet map showing the German possessions in the Kamerun district and Togoland. Part 12 contains No. 10, a map showing influence of German exploration and missionary work in Africa, together with the extent of German possessions in Africa. No. 14, sheet 4 of a four-sheet map of the Kamerun district and Togoland. In addition to the principal map, numerous insets are given.

Historical Geography. **Poole.**

Historical Atlas of Modern Europe from the Decline of the Roman Empire; comprising also maps of parts of Asia and of the New World, connected with European History. Edited by Reginald Lane Poole, M.A., PH.D. Lecturer in Diplomatic in the University of Oxford. Part vii. Oxford: The Clarendon Press. London, Edinburgh, and Glasgow: Henry Frowde. Edinburgh: W. & A. K. Johnston. 1897. *Price* 3*s.* 6*d. Presented by the Clarendon Press.*

Part vii. of this atlas contains the following maps: Sheet 3, four maps of Europe, from 565 A.D. to 720 A.D., with notes by Professor Bury. Sheet 18, England and Wales in the reign of Edward I., with notes by Professor Tout. Sheet 49, Russia, illustrating the growth of the Empire, from the Accession of the House of Romanov, 1613, with notes by R. Nisbet Bain.

CHARTS.

Chilian Charts. **Oficina Hidrográfica de Chile.**

No. 63, Caleta Quiutil, Costa de Chile. No. 64, Bahia de Angud, Costa de Chile. Taller de la Oficina Hidrográfica de Chile, 1897. *Presented by the Oficina Hidrográfica de Chile.*

United States Charts. **U.S. Hydrographic Office.**

Pilot Charts of the North Atlantic Ocean for April, 1897, and North Pacific Ocean for April and May, 1897. Published at the Hydrographic Office, Washington, D.C. *Presented by the U.S. Hydrographic Office.*

PHOTOGRAPHS.

China, Japan, and Korea. **Bishop.**

Views in the Far East. Photographed by Isabella L. Bishop, F.R.G.S. Collotyped by S. Kajima, Tokyo. *Presented by Mrs. Bishop.*

This is a very beautiful series of collotype prints, by S. Kajima, Tokyo, from photographs taken by Mrs. Isabella L. Bishop in Korea, China, and Japan. They illustrate the scenery, buildings, and inhabitants of the different districts through which Mrs. Bishop travelled, and form a valuable addition to the Society's collection.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.

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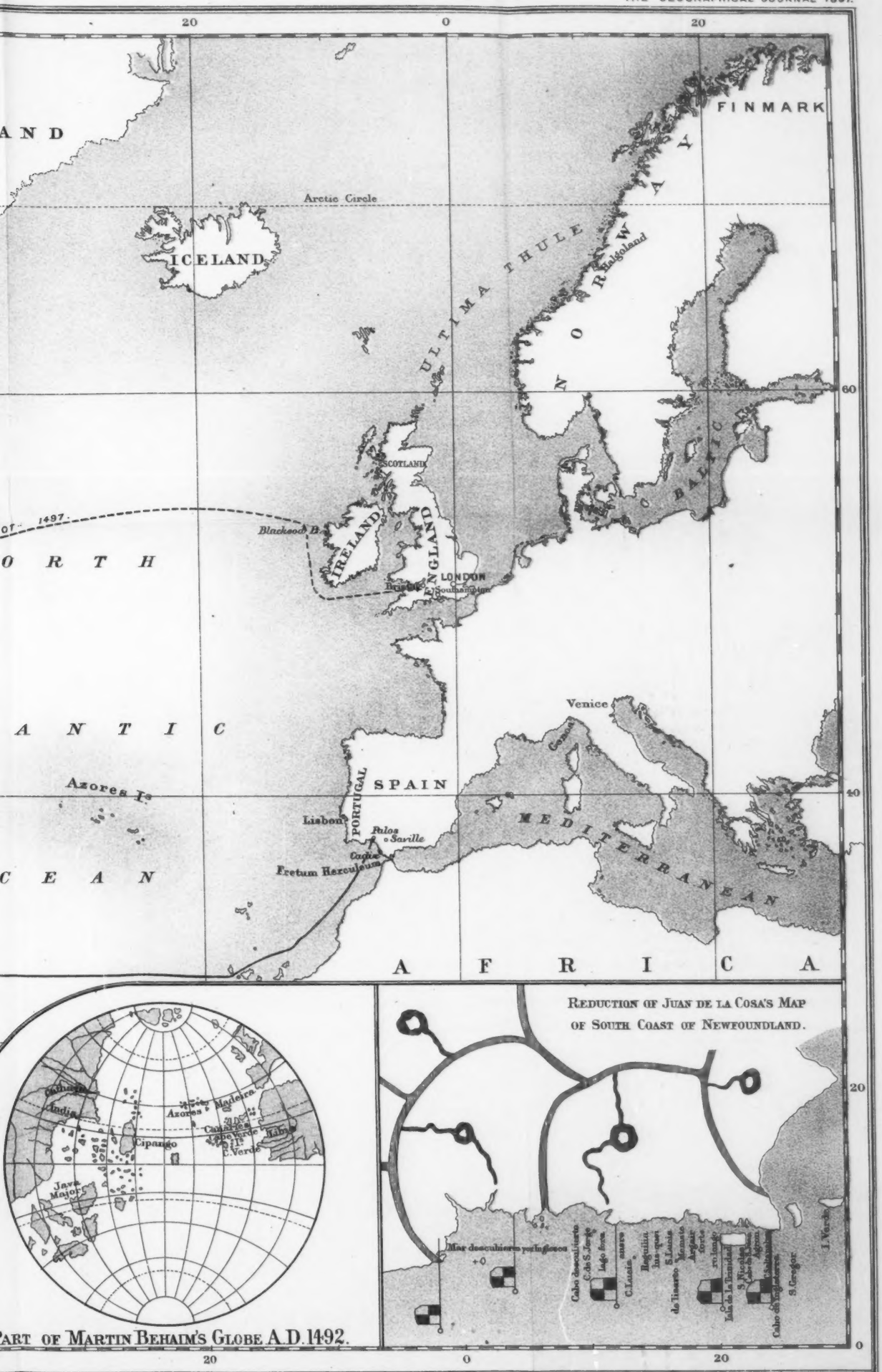


PART OF MARTIN BEHAIM'S GLOBE A.D. 1492.

...d by the Royal Geographical Society.

F.S. Waller, F.R.G.S.

13° 10′ 20′

TRIPOLI

Sidi Dalsi

Ras Tajura

Palm Groves

Kushas (Limekilns)

Kasr el Hazni

Marabut Sidi Abd el Kerim

Semi-Cultivated Plain

Argub Tajura

Quarries

Ghirgarish

50′

Abd el Jelil

Gheran (Ancient Quarries)

Zenzur

Jedrat el Jellaba

140 Bir Namush
Camp, March 21. 1895

Ain Zara

Sandy Desert

Bir el Tuteh
Camp, March 1896.

J. Khashm Aruf bears 170° Fum Doga 142°

Bir Zekellai

Neshieh Oasis

Sandy Waste

Bir el Turk

Fum Doga 142°

Well

Khawaije

Fum Doga 142°

170°

AKARA

Khashm Aruf 154°
Fum Ismar 156°

Tobras

40′

Kubba Sidi Alaem

140 Camp, April 2

Fum Doga, 103°

Bir Jenuna

W. Serrl

Wadi el Jair

Bir Sbeia (Zebea)

W. Libetr

ALAUNA

W. Ismar

W. Kubba Sidi Bargub (Barth)

Kubba Sidi es Sayah
410

W. Majenin

Plain

Partly Cultivated

30′

211°

420

J. Battus

HAMADAT

W. Melgha

Sayah

J. Mdawar

J. Mamureh

520

DRAH

TARHUNA

W. Halfa

236°

Camp April 1
810
Corn Land

Thaniet Bu Ghelan

El Nuebat mta Ergaat

32 20′

202°

Cliffs

Cliffs

W. Gethathet Dum

W. Bir el War

Kushiah Gamalah

W. Wir

W. el Kem

S. el Megagrah
980

1220 Well Camp, Ma

GHARIAN

Camp, Mar. 31
1450

J. Tekut

Average Height of Patches of Corn & Halfa on Lower Hills 2000 ft. Slopes

W. Harmuch

J. Jumma
1800

Sen.

1450
Ras el Aswad

Shaabbet el Jerag Jumah

Sen.

Camp, Mar. 30
1450

J. Maid

13° 10′ 20′

F. G. Ravenstein

30' 40' 50' 14°

Ras al Kitab
Wadi Ramil (W. al Ramil)
Water
Sidi Ben Nur
Wadi Maid (Wad al Demeidh)
Ugleh of Shaikh Khalifa Burufa
Ras Sotara
Wad Ipsi
W. Bu Jafaru (Barth)
Ras el Hamra (Ras al Jafara)
Welad Busfaras
Date Palms
Kasr Jafara or Karabuli
Palm Grove
Mita mta Terr'gurt (Sandy Desert)
Turki
Gu'aea mta Gummata
W. Gerim
Abd al Aati
W. Doga
Partly Cultivated
Terrgurt 88
W. Saghla (Sariye)
Wadi Ramil
Wells Sandy Waste
Camp. Mar. 22
500
Camp Mar. 3
W. Terrgurt
W. Dighin
J. Karathia 114
Jeabin Plain
Sen. Kharush
820
S. Bu Saiedeh
J. Ahmar
J. Aref 675
Kasr S. Fagha
J. Aref 1000
Kasr Semama 750
Shabbet el Shuaud
S. Argub el Mukhalif
Henshir Aulad Ali
S. el Hudal
Sen. Fajej
Sen. Semama
W. Karathia
J. Gumata 886
M S
Kasabat 1250
Kala (Gella)
Ruins of Spanish Fort
El Wata
Olive Groves
J. Silma
Kasr Barimech
Mehal el Meadi (Ruins)
J. Khashm Arûf
(Remarkable Peak of Adm. Chart)
J. Bu Tawil
Wadi Ihoga
J. Ghararat
J. Arva 1610
Sen. Atershanin
Plateau Musbah Buthahf
Ruins
Ruined Ca
W. Terrgurt
W. Soman
Wadi
Sen. Kasr Doga
Sen. Ras el Guman
Ras el Guman (Conical Hill)
Kasr Doga 1230 Mar. 23
Ras el Doga
Ain Shershara 1000
Wadi Tawileh
Ruins
Roman Ruins 1300
Zaouia Sheikh el Madoni
Ras el Benaieh
Ras el Ida
Sidi el Ag Ibrahim
Camp. March 5
Mar. 24-25
Ras el Mshaala
Sen. el Mansura
Sen. el Ragud
Sen. el Tesha
El Khadra
Kom el Khadaja
Sen. el Bir
El Uflah
Sen. Um el Tuluthcina
Kom el Suuds
Kom es Las 1130
Menshir Maagel
Kom el Lobel
Bu Agreich
Camp. Mar. 28
W. el Uflah
W. Bubak Kebir
Kasr Daun
Kurmet el Hatheia
Kasr Zugusch
Camp Mar. 26. 1220
Rs No. 1
Rs No. 2
Rs No. 7
Shabbet el Khett (Roman Dams)
Rom. Castle
Sen. el Joreh
Menshir el Mauga
Sen. el Bughlah
Sen. Rom. Nasr (Henshir el Mareh)
Sen. el Bir
Rs No. 3
Rs No. 4
Rs No. 8
Sen. el Nejm (Rs No 6)
Sen. el Hazem
GHIRRAH
Sen. Ruuni
Sen. Bu Samida
Bu Hamide (Ruins No 5)
Girrah el Kebir
Camp Mar. 6.
Rs No. 11.
Sen.
Seyam (Ruins No. 9.
Sen. Rs No. 10.
Roman Well 1100
Melgha Rocks (Henshir Suan)
No Wells along this Road
Welad Bu Menian Pass
Tarhuna Plain
ZERAGHNA
MAMURAH
TAHWALEH
Wadi Kseia
Wadi Koreish
J. Maid 1320
Camp. March 7.
Ruins on Hill
Camp. March 27.
Kasr Mohammed
720
J. Koreish
Kasr Mamurah
Sen. el Gharabaha
Sen. Bu Mate'erah
Kasr Saade
March 8. 9.10 a.m.
El Gherat el Tawileh 157°
Ras Um Terraieh 138°
J. el Berraieh 155°
Ras Um Terraieh 165°
J. el Berraieh 172°
Ras Um Terraieh 197°
J. Thuhun 223°
J. Thuhun 210°
Ras or J. Ben Sukhrah 221°
1180 W. Tinxiwah
BENI ULID
Sidi Bu Rekr 249°
980
Camp, March 29.

Published by the Royal Geographical Society

50'
14°
10
Uglab of Sheikh Khalifa Burufa
Ras Sotara
Wad. Ipsi
W. Bu. Jafara (Barth)?
Ras el Hamra (Ras al Jafara)
Welad Bufaras
Marea Belkan
Wad. Bessi
Ras Buswara
W. Igrid
Palm Grove
Guaea mta Gummata
W. Gerim
Abd al Auti
Sidi Abd el Ali
W. Ganin
S E L I N
490
Negaxi Pass
820
Merabut bu Ghada
Kagr Allāhum
W. Terrgurt
J. Gumata
886
Msalata 1017
(Adm. Chart)
M S A I
Merabut el Khimet
Kusabūt
1250
Kala (Gella)
Ruins of Spanish Fort
El Wata
J. Silma
W. Karathie
Olive Groves
Barth
Kasr Saade
March 8.
9.10 a.m.
Merabut Sidi Hamid
(Vill. on Conical hill)
Corn Field
Ruined Date Palms
March 8.
11.45 a.m.
Kasr Anamre
Depression
Barth
Kasr
Wadi Ueni
J. Mesid
1320
Camp March 17.
Ruins on Hill
Kasr Mohammed
720
Wadi
J. Korrish
Kasr Mamurah
Sen. el Gharabah
Wadi Ueni
Ksei a
Sen. Bu Mate'erah
Sen. ben Hamedan
Kasr Karker
(Rom. Ruins)
El Ufiah
Kasr Daun
Kurmet el Hatheia
Kasr Zuguech
Mar. 26.
1220
Rs No. 1.
Rs No. 2
Rs No. 7
Shakbet el Kheita
(Roman Dams)
Rs No. 8.
Sen. el Nejm
(Rs No. 6)
Rs No. 3.
Rs No. 4.
Bu Hamide
(Ruins No. 5)
Sen. Bu Semida
Comp. Mar. 6.
Rs No. 11.
Senam (Ruins No. 9.
Rs No. 10.
MAMURAH
TAHWALEH
Lib Lism 115°
Ras Um Teratch 197°
J. el Bemaieh 172°
Ras Um Teratch 165°
El Guerat el Tawileh 157°
Ras Um Teratch 155°
J. el Bemaieh 155°
I D
50'
14°

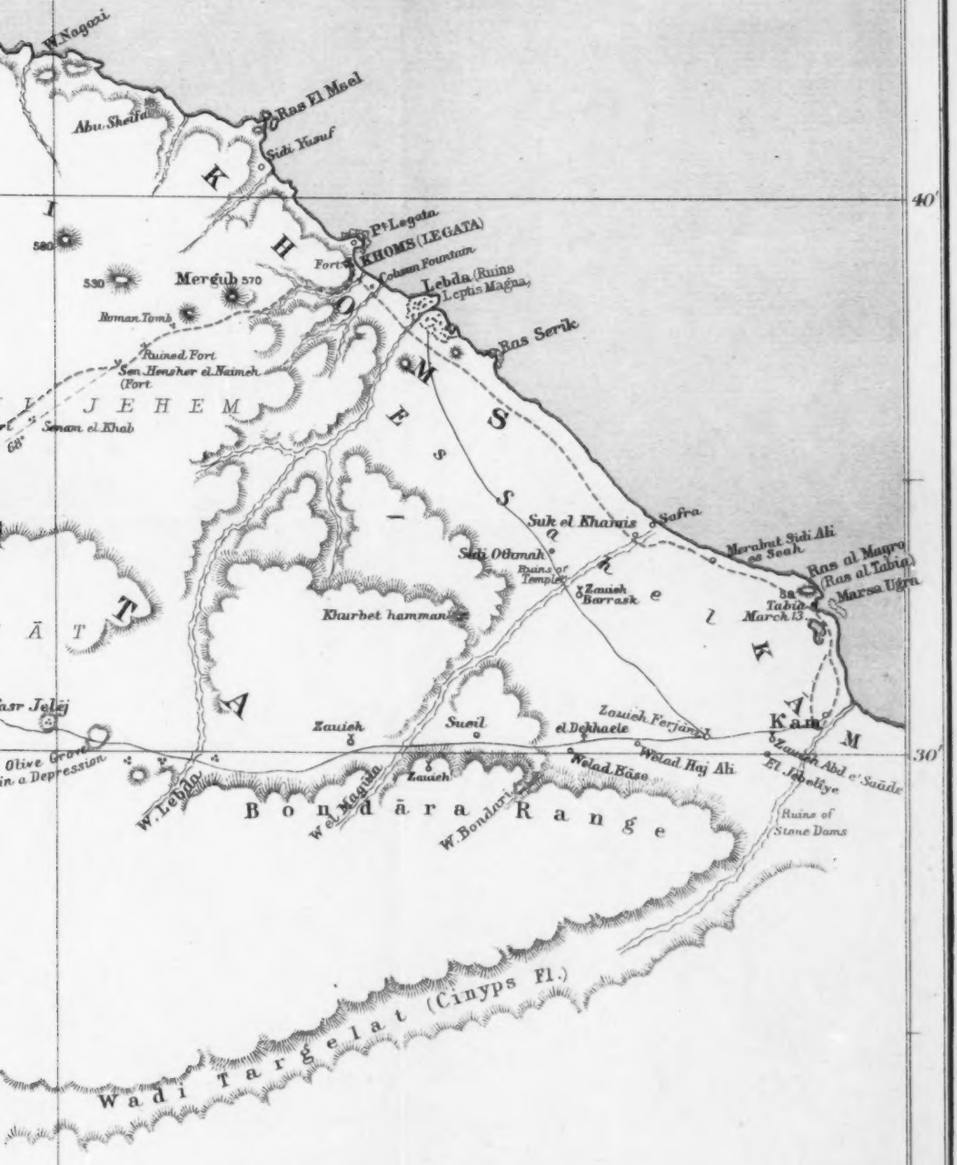
A MAP OF PARTS OF GHARIAN, TARHUNA, AND M'SALATA (TRIPOLI).

By H. SWAINSON COWPER, F.S.A.

1895 and 1896.

———— *The Author's Routes in 1895.*

– – – – – – – *Additional Routes in 1896.*



Scale—1 : 200,000.

Statute Miles.

0 5 10

ALL BEARINGS ARE MAGNETIC.

Abu, *Father.*
Ain, *Spring.*
Aulad, *Children—Sons.*
Beni, *Sons.*
Bir, *Well.*
Fum, *Mouth.*
Henshir, *Fenced Enclosure.*
Jebel, *Mountain.*
Kasr, *Castle.*
Kom, *Hillock.*
Marsa, *Harbour.*
Merabut, *Saint's Tomb.*
Ras, *Head—Cape.*
Senam (*S., Sen.*), "*Idol.*"
Wadi, *Torrent-bed.*
Welad, *Son—Child.*
Zauieh, *Chapel.*

George Philip & Son, London & Liverpool